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MOTOR AGE

FRENCH PUT MOTOR UNDER SHOW MICROSCOPE

Salon Brings Out Latest Foreign Practice in Engines—Other Mechanical Ideas Inspected by the Critics

PARIS, Dec. 10—The motor at the Paris salon having the highest ratio of stroke to bore is the new four-cylinder Sizaire-Naudin, the dimensions of which are 2 7-10 by 6⅜ inches bore and stroke. This gives a ratio of 2.42-to-1. But the long stroke is not the only interesting feature of this motor. The cylinders are a single casting, with valves on opposite sides, stems enclosed, and presenting a square box appearance. On the former model, of 2 7-10 by 4 7-10 inches, the valves were superimposed, with a single camshaft. The change to two camshafts has allowed a better position of the spark plug, and an increase of the valve diameter, the diameter now being 2⅛ inches. This is probably the largest area of any standard motor on the European market.

It is significant to note that the ball bearings formerly employed on this firm's four-cylinder motors have been dropped for the plain type. The crankshaft is of original design, having only two throws, thus pistons Nos. 1 and 2 are connected up to one crankpin, and are at 180 degrees to pistons 3 and 4. Counterweights are carried on the crankshaft. Tubular connecting rods are employed, and light pressed steel pistons are used. The lower half of the connecting rod bushing is common to two connecting rods. A silent chain is now used for driving the two camshafts. The housing at the forward end of the motor carries two camshaft pinions, and the other taking the drive from the mainshaft to the magneto shaft. To facilitate timing of the motor a hole is bored through each pinion and a corresponding hole in the wall of the crank-chamber. When the pinions have been locked by a fine bolt passed through these holes, it is only necessary to put on the chain to have the correct timing. Cooling of the motor is by thermo-syphon, but instead of five rows of copper tubes the radiator is now composed of a single row of narrow tubes the full depth of the radiator. Each tube is about 2½ inches in depth, from front to rear. The belt driven fan is a one-piece aluminum die casting, Fig. 5. In place of simple splash lubrication with dippers on the connecting rod ends, as used on the ball-bearing motor, forced feed lubrication is now employed. The pump is driven off the mainshaft, drawing its supply of oil from the base chamber and delivering it by internal leads to the two main bearings and through the hollow shaft to the connecting rod ends. The oil filler L is on the exhaust side of the motor. Attached to the cap is a broad fiber gauge descending into the base, and giving the oil level on being withdrawn. The space between the crank-chamber and the side frame is enclosed, and in order to reduce all visible piping to a minimum the intake water pipe W from the radiator is carried under this plate until it reaches the center of the cylinder bloc; thus there is only a 2-inch length of piping visible. This design has aroused general interest among designers in attendance at the show.

For the First Time in History a Uniform System of Decoration Was Used at the Paris Salon

THE LATTICE FENCE EFFECT WITH ELECTRIC LIGHTS WAS ATTRACTIVE

On the intake side the magneto and carbureter are both encased. The magneto is buried in the crankcase casting and is yet on a level with the side frame. It is covered by a light aluminum cover K, held down by a spring clip S, only the four terminals being visible. The carbureter is treated in the same way, the float chamber being entirely under cover, yet instantly revealed by the removal of a spring clip S1. A Y-shaped tube leads up from the carbureter to the intake ports, the whole being dismountable by withdrawing two bolts. The magneto wires are neatly led up through a brass tube T between the forked branches of the intake pipe and the body of the motor. Although rated at 14 horsepower only, the motor is declared to have given 34 horsepower on bench tests. It is without doubt one of the cleanest cut motors at the show, and the one that most closely approaches the box-like form now being adopted by French constructors.

After the Sizaire-Naudin the longest stroke is to be found on the Hispano-Suiza, a motor of 80 by 170 millimeters (3.1 by 6.6 inches bore and stroke) or a ratio of 2.12-to-1. Then follow at least half a dozen makers with a ratio of 2-to-1, prominent among them being Gregoire with 80 by 160 (3.14 by 6.29 inches), Peugeot and Sautter-Harlé with 75 by 150 millimeters (2.95 by 5.9 inches). The rest average 1.6-to-1. This is sufficient to prove that the long-stroke motor is accepted unhesitatingly by continental manufacturers.

An important feature of the show is the en bloc casting of motors with all water piping and intake and exhaust manifolds. Two years ago the bloc casting was confined to four-cylinder motors of not more than 3¼ inches bore. Almost without exception this type of motor is now a single casting, generally with the intake manifold as an integral part, but very frequently with a separate exhaust manifold. But an extension has been made so that this year it is common to find six-cylinders in one casting, some of them having a bore as high as 3½ inches. Examples are to be found on the new Panhard of 80 by 120 (3.14 by 4.72 inches), the new Fiat of 80 by 130 (3.14 by 5.1 inches), a Delage of 65 by 125 (2.55 by 4.92 inches), a new La Buire of 90 by 130 (3.54 by 5.1 inches) and a Rochet-Schneider of 95 by 130 milli-

THE PANHARD'S NOVEL KNIGHT MOTOR EXHIBIT

General Scheme of Skeleton Ironwork Used in the Paris Salon

meters (3.74 by 5.1 inches) bore and stroke. This motor is the largest six-cylinder in one casting to be found in the show.

Generally a single length of piping connects the carbureter with the water-jacketed gas passages cast with the cylinders, and it is a very common practice to place the carbureter on the side opposite to the valves. This is found on the new Rochet-Schneider, the La Buire, and on the Fiat. But the Fiat people have gone further than any other maker by abolishing all intake piping. On the right-hand side of the motor is a float chamber, the two vertical nozzles are within the cylinder casting and the throttling is done within the cast intake manifold. Primary air is drawn in through a wire gauze screen at the base of the cast intake tube, and supplementary air is given in the mixing chamber above by mechanical operation connected with the throttle opening. Naturally the valve springs are enclosed; indeed it would be difficult to find a motor on which the valve stems are visible. A remarkably united movement is shown towards carrying the magneto and water pump across the front of the motor, the two being worked off one shaft. This is the system adopted on the six-cylinder Fiat, on the Berliet models, on the Rochet-Schneider, Lorraine-Dietrich, Mors, Sautter-Harle and others. The change appears to have been made with the object of given greater accessibility to the valves and carbureter, and certainly it succeeds in this object.

Each Exhibit Used a Circular Sign With Electric Letters

Thermo-syphon cooling has made wonderful progress. It is shown by the fact that it is now being adopted by French makers for some of the largest six-cylinder motors. As stated last week, the Charron has thermo-syphon on its six-cylinder models as well as all smaller sizes, and does not even use a fan—the radiator is located at the dash. Another firm having made the same change is the Bayard-Clement, all the touring cars now having thermo-syphon, no fan, and Renault type of bonnet. In general design there is little to distinguish the Bayard-Clement cars from those produced in the Charron factory. Another notable example of the abandonment of the pump is to be found on the new six-cylinder Leon Bollee. Here the radiator remains the same and a belt driven fan is

employed to assist the cooling. Although there are plenty of firms having followed the Renault lead in the matter of cooling, very few have made the additional change of placing the radiator back of the motor. This is now done by Bayard-Clement, Charron, Sautter-Harle, Unic, one model only, Scar, Hurtu and Schneider, a new provincial firm having copied last year's Charron model with fan in the radiator. There is plenty of evidence that the water pump will have to go sooner or later.

Evidence is not difficult to find of the growing popularity of forced feed lubrication. There are two main systems, one in which the oil is pumped from the crankcase sump to a sight feed or feeds, and then allowed to drip to the main bearings and the connecting rod ends, as on the Charron and the long-stroke Gregoire, or the increasingly popular method of delivering it to all parts under pressure. It is this latter method that has just been adopted by Renault for all 1911 models. The crankshaft is bored to allow the oil to be carried to the connecting-rod ends. When this method is adopted all external oil pipes are abolished, examples being the new Sizaire and the latest type of Renault, the oil pump in each case being within the crankchamber and the oil leads internal. Renault has even abolished the lead to the pressure indicator on the dash by placing a sight tube on the front of the motor. Easy dismounting of the pump has frequently been taken into consideration, as is shown by the removal of this organ from the rear to the front of the camshaft on the Charron models. Although within the crankchamber provision has generally been made for dismounting the oil pump from the base by a trap in the undershield, as on the Gregoire and the F. L. In a few cases, however, the pump is external, and yet at the base of the crankchamber, as on the Sautter-Harle six-cylinder model and the Chenard-Walcker new four. The claim made is that in such position the pump has oil to draw upon until the last drop has been consumed, and that it is more readily examined and dismounted than when within the chamber. There appears to be a tendency, too, to supply oil under pressure to the gearbox and rear axle. This is done on the Hispano-Suiza cars, and on the Charron. In this latter case the oil is delivered under pressure to the sight feed, then allowed to drip to the gear-box, from which there is a direct connection through and a constant level maintained with the rear axle. Renault, on the other hand, has preferred to provide for separate lubricating of the gearbox and rear axle by placing large and easily opened fillers on each of these organs. The gearbox filler on the side of the frame member, with a suitable lead, has been abandoned, and the same system has been taken up by Berliet, who has an oil box on the frame with leads to the universal joint, gearbox and rear axle, and instructions to fill every day.

Controversy regarding ignition has been settled, at least so far as continental manufacturers are concerned. The high-tension magneto is fitted everywhere, there not being a low-tension magneto in the entire hall. The half dozen leading English firms having taken stands in the Grand Palais are conspicuous by the unanimous way in which they adhere to storage batteries as a standby, or for ease in starting. It is in striking contrast to the French, Italian and German makers, who are of the opinion that a magneto and one set of plugs is all that is necessary for even the most costly car, and at the same time the indispensable equipment of the cheapest production. This in a large measure explains the difference between the clean-cut French motors and the complicated looking productions of

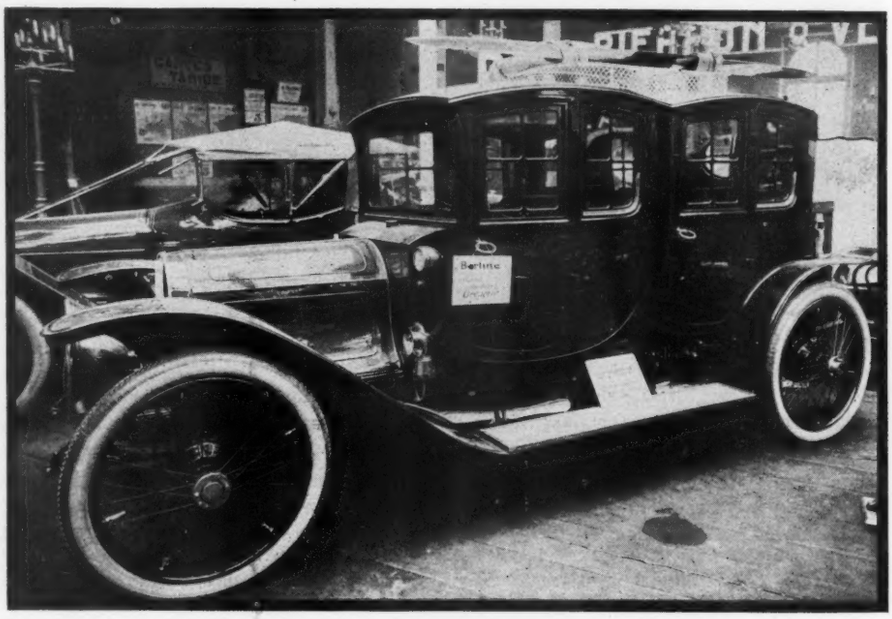

FIG. 1—ENCLOSED GREGOIRE TYPE BECOMING VERY POPULAR

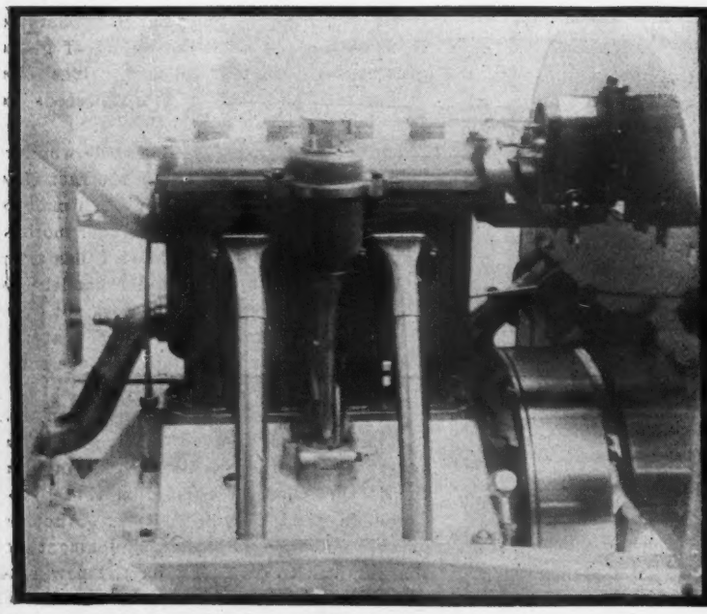

FIG. 2—COTTEREAU VALVELESS MOTOR

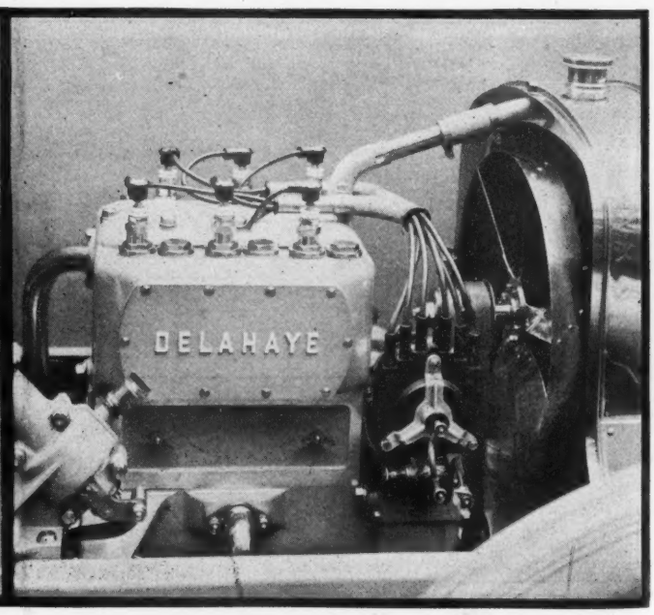

FIG. 3—SIX-CYLINDER, V-TYPE DELAHAYE

the leading factories in Great Britain. Makers are moving rather cautiously towards the adoption of ball bearing crankshafts. Where they have been taken up it has generally been for small motors, and with the object of gaining space. Thus Delage has fitted a central ball bearing on his compact six-cylinder because he had not sufficient space for a plain bearing. Darracq has adopted ball bearings for the popular 80 by 120 millimeters (3.14 by 4.72 inches) model; Sautter-Harle employs two-ball bearings and a central plain bearing for a six-cylinder motor of 75 by 150 millimeters (2.95 by 5.9 inches); Bozier employs ball bearings for a small four-cylinder monobloc motor. Sizaire-Naudin, on the other hand, after employing ball bearings for several years on all their long-stroke single cylinder racing motors, and for 1 year on their serial four-cylinder cars, have returned to plain bearings for the standard product of their factory.

The introduction of the Knight motor has set European inventors at work to produce something equally as good. The task is not an easy one, and in some of the motors to be seen at the Grand Palais Charles Y. Knight might have reason to believe that his patents had been infringed. Berliet has made an attempt to get away from the poppet-valve motor by adopting piston valves, there being two for each cylinder, one serving for the intake of the charge and the other for the exhaust. The model shown is a four-cylinder in one casting of 3.9 by 5.5 inches bore and stroke. The eight piston valves are connected up to a secondary crankshaft driven by a spur gearing off the main-shaft. Everything is enclosed, intake and exhaust manifolds being cast with the cylinders and all water pipes being integral. It was evident from the lack of information available that the motor is still in an experimental stage, and it was not even known whether it would be finally adopted by the firm.

Considerable interest was shown in a slide-valve motor shown by the Rolland-Pilain company. Within the cylinder is a single sleeve fitted with three deep compression rings, and having two ports, one for the intake and the other for the exhaust. In addition to the two openings in the cylinder wall communicating with the intake and exhaust ports there is a third one entering into a pocket carrying the spark plug. The cylinder head differs considerably from that employed on the Knight motor. It is really a cylindrical-shaped head descending into the body of the cylinder and of slightly less diameter than this latter. Thus, on the upper portion of its stroke the sleeve is in friction with two walls, the cylinder proper on the outside and the cylindrical head on the inside. As the cylinder head is hollow and carries a mass of water equal to the cylinder area, very efficient cooling is provided at this point, but it, of course, becomes impossible to place the plug in the head of the combustion chamber. It is for this reason that a pocket has been formed right through the cylinder wall and just above the intake port, this pocket being uncovered by the sleeve to allow of firing the charge at the opportune moment. As on the Knight, a chain drive and eccentric are employed for operating the sleeves.

On the Mustad motor, instead of the concentric sleeves of the Knight, there are two semi-circular sleeves, serving respectively for the intake and the exhaust and operated independently. The inventor declares that the motor has been under test for 2 years and has covered 20,000 miles on the road.

The Henriot is a rotary-valve motor, an example of which is shown in a small four-

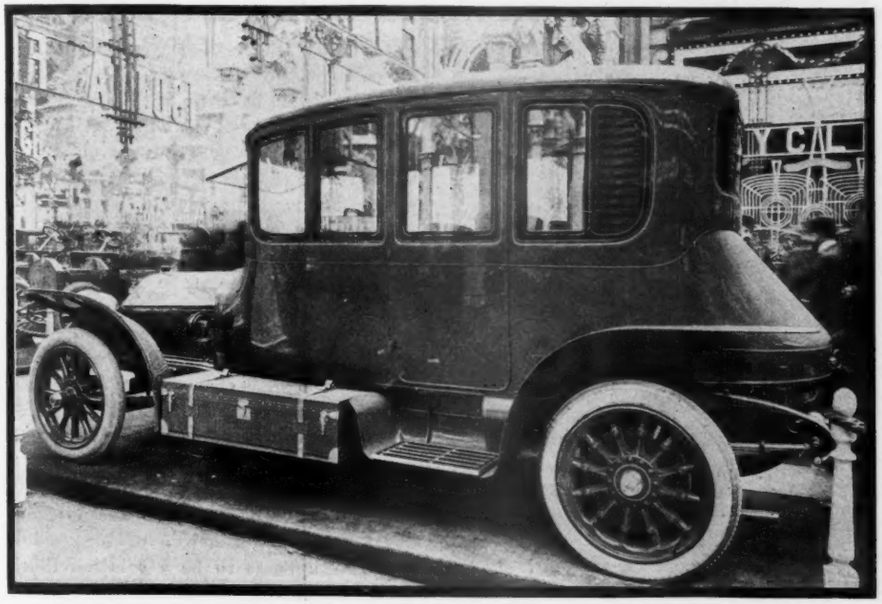

FIG. 4—FIAT, WITH TORPEDO LIMOUSINE DESIGN

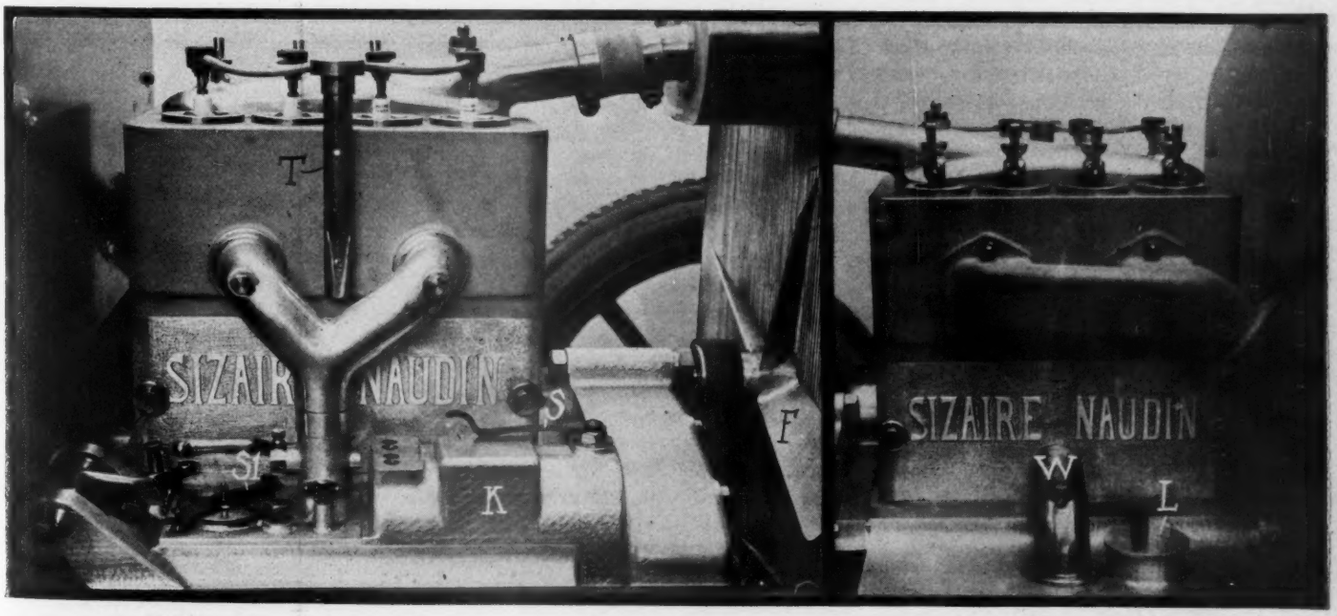

FIG. 5—FOUR-CYLINDER SIZAIRE-NAUDIN, WITH MAGNETO AND CARBURETER ENCLOSED

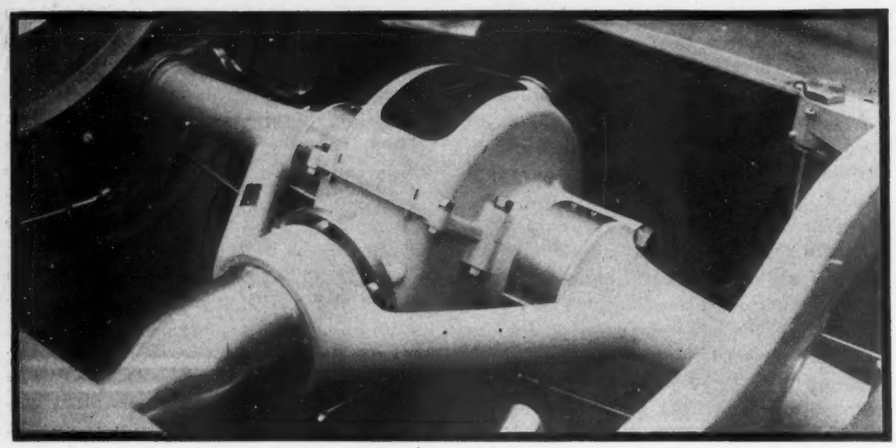

FIG. 7—PEUGEOT REAR AXLE. THE AXLE HOUSING IS A FORGING WITH A V-PROJECTION TO CARRY THE PROPELLER SHAFT PINION

cylinder monobloc. At the head of the motor is the rotary valve consisting of a shaft about 2 inches in diameter, driven off the crankshaft by bevel gearing and a vertical spindle. At four different points the face of the roller is cut away, and it is by this cut away or flattened portion of the roller that the intake and exhaust ports in the cylinder head are uncovered Provision is made for lubricating the walls of the rotary valve. The design has very much in common with a rotary valve experimented and patented by Anzani 2 years ago, then abandoned.

In the Cottereau is to be found a slide valve similar in its underlying principle to the Reno described in a recent number of Motor Age. But while in the Reno the valve ring in the cylinder had a reciprocating motion, uncovering the intake port on its down stroke and the exhaust stroke on the upstroke, the Cottereau has a rotary motion, is provided with a port on its face, and alternately uncovers the intake and exhaust ports situated at opposite sides of the cylinder. On the exhaust side of the motor an enclosed vertical spindle drives an overhead shaft on which are four worm gears, each one meshing with the extremity of an inverted T, the two arms of which are within the hollow axis of the ring valve. The ring, turning at half the motor speed, and uncovering the intake and exhaust ports, is entirely in the combustion chamber of the cylinder. Lubrication is provided by an overhead oil bath for the worm gears, with a lead through the T to the walls of the ring. The overhead shaft drives the magneto, mounted on a suitable platform at the rear of and on a level with the cylinder heads. The high-tension distributor of the magneto is within a glass cover on the driver's side of the dashboard, thus

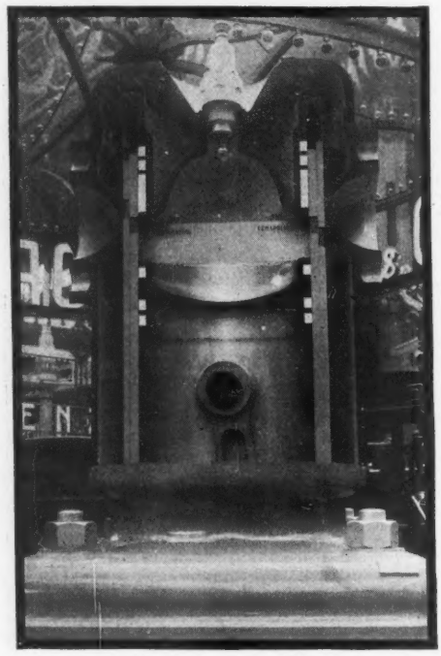

FIG. 8—SECTION OF PANHARD-KNIGHT MOTOR

allowing a permanent examination of the working of the magneto. This motor has already undergone serious tests on the road and been successful in hill-climbing competitions. It is now being built by the firm in series.

The Knight motor was represented by Panhard, Daimler, Minerva and Mercedes, the holders of this license in France, England, Belgium and Germany. At the Panhard stand was a large scale working model with a bore of not less than 3½ inches, and which never failed to attract the attention of visitors.

The present show marks the end of the chain drive. Up to this year several of the largest French firms have held to the chain for the most powerful types of cars. Now Panhard, Delahaye, Mors, Brasier, Leon-Bolle, Fiat, Mercedes and others show powerful cars with shaft drive. Chain-driven cars can still be had, but they are generally racing or semi-racing types of vehicles. In the treatment of rear axles there is probably more variety than in any other part of the car, and changes by the various firms are not at all common. Lion-Peugeot, who last year fitted their light cars with chains, now use a live axle with double reducing gear. The crown bevel B, Fig. 10, is on a countershaft, on the center of which is a spur pinion P engaging with a larger pinion P1 on the drivingshaft. Renault has modified his design, carrying the propeller-shaft in a torque tube for the large models, and fitting a new type of tubular torque stay for the small cars. This was illustrated in Motor Age last week. The Italian concerns show a decided preference for combined rear axle and torque tubes in a couple of steel stampings. Examples are to be found on the Isotta-Fraschini and Fiat cars. Generally on the French cars the casing of the propeller-shaft fulfils the function of torque tube, and this appears to be a solution that is gaining ground. Delahaye has slightly modified his design by using two radius rods from a hanger under the frame mem-

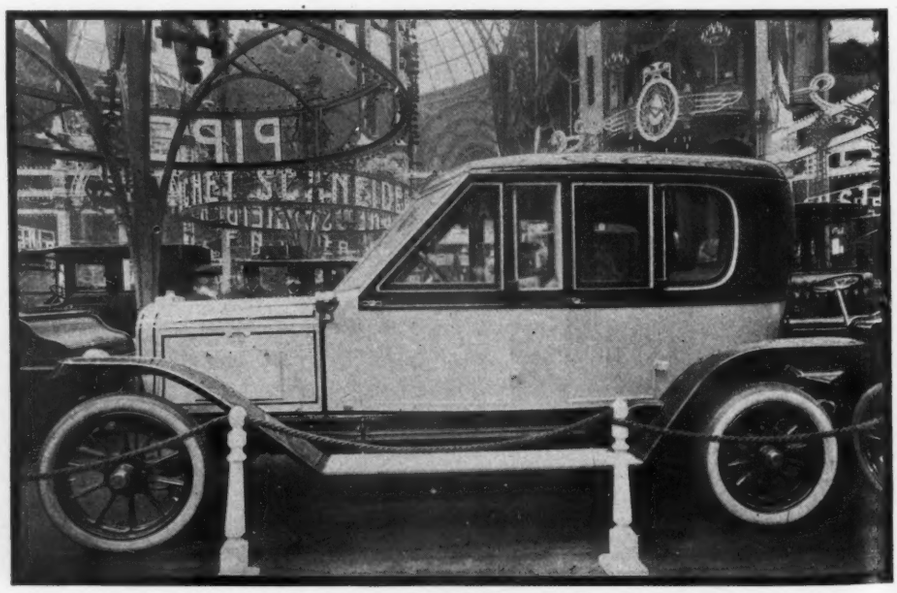

FIG. 9—PIPE CAR WITH COMMENDABLE TORPEDO LIMOUSINE. THIS BODY TYPE IS GAINING. IT IS ECONOMICAL FROM A FUEL VIEWPOINT

ber to the axle housing, and a torque rod from the top of the differential housing to a cross member of the frame. The pivoting joints on the rods are neatly enclosed in a leather boot.

Outside the English section of the show, there is only one worm drive in the exhibition. It is found on the Darracq six-cylinder chassis, and has evidently been hurriedly produced, for it was unknown at the factory 1 month ago. French makers on the whole do not appear to be favorably impressed with the worm drive; doubtless the Darracq production is intended to please the English rather than the continental motorist.

There is a new mechanism giving four direct drives in the Miolans. On the crown bevel are screwed three sets of spur pinions, and on the opposite face a single set of teeth. The driving pinion has a sliding movement on the extremity of its shaft, allowing it to come into engagement with hny of the three sets of gears. The first speed is obtained by driving on the opposite side of the crown wheel through a layshaft.

The closed-body type continues to be in favor and it is but natural that with the advent of the torpedo for open cars there should be adaptations of it to the enclosed types. Perhaps no concern has gone farther in this respect than the Fiat company, which exhibits a unique car, Fig. 4. The body part is more of a motor boat design. It is rounded at the front and rear and has abundance of window space on all sides. This body is considerably lighter and has less overhang than the heavy-top, present-day limousine, and from this point of view indicates progress.

In the more conventional limousine type, Fig. 1 shows the Gregoire double limousine. This vehicle resembles two limousines closely coupled together with a regular door for each. This body type is looked upon as the exclusive design at the present season

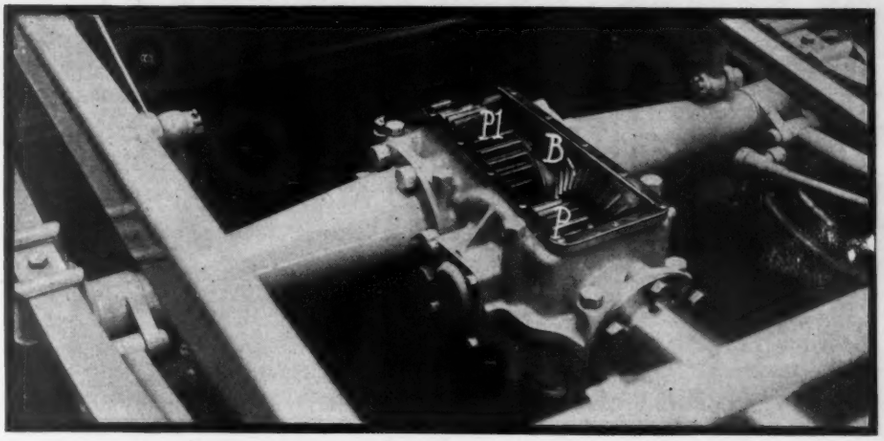

FIG. 10—LION-PEUGEOT WITH DOUBLE-REDUCTION GEAR AT THE REAR AXLE. THIS DESIGN IS GAINING IN FAVOR

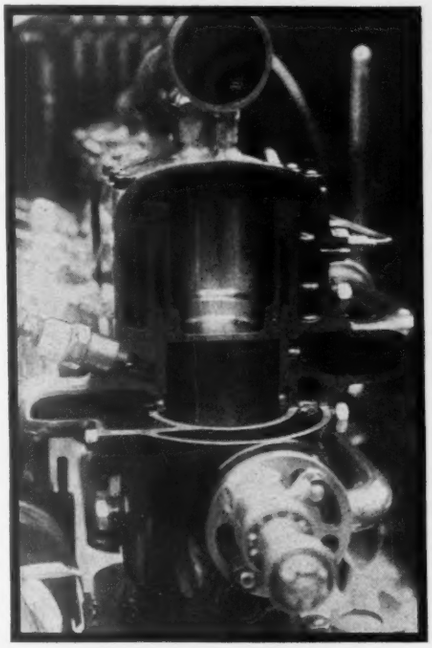

FIG. 11—SECTION OF ROLLAND-PILAIN SLEEVE VALVE MOTOR

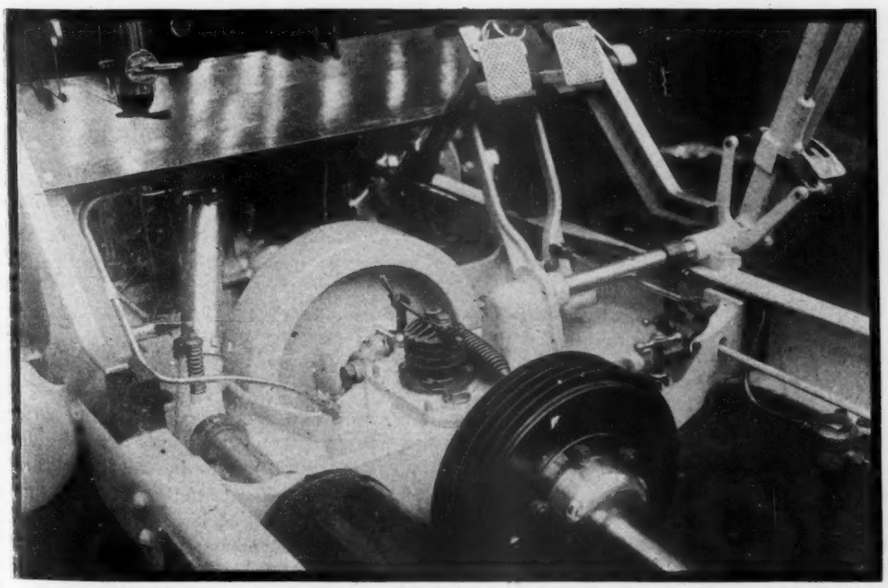

FIG. 12—ON THE SPANISH CAR, HISPANO-GUIZA A POWER AIR PUMP FOR TIRE INFLATION IS CARRIED ON THE GEARBOX AS ILLUSTRATED

and many concerns are making up two and three of these on special orders. A novel adaptation of the torpedo is the Pipe, Fig. 9, in which the front of the enclosed compartment slopes upwards at an angle of 45 degrees to the rear. This body has two side doors. A considerable weight reduction is obtained by this design and the question of windage is also reduced.

In the standard open types there are many torpedo designs. It is becoming customary to use the side door on runabout types, which are being shown more by French concerns than in the past. In all the torpedo effects the dash lamps are being eliminated wherever possible, and it is a safe statement that in another year there will scarcely be a car shown with large type of dash lamp.

The landaulet type of body has not continued to occupy the great place of prominence it was expected to a few years ago. This is unquestionably due to the difficulty of building a body of this type which will not rattle after it has been used. Rattling has been the great objection to the landaulet design and it is questionable if it will not be the cause of its final elimination.

With the adoption of the torpedo body the old problem of carrying the extra casing has come to the front and the possible solution is the rear torpedo extension, which allows of amply carrying space under the rear seat. This is without doubt the best solution of the question. The extra tire casings have got to be concealed and there is at the present time no other satisfactory place. This is a satisfactory location, in view of the fact that pressure feed on the gasoline is becoming general. This means that the gasoline tank is located under the rear of the chassis, thus leaving the entire space under the front seat for tools and other necessaries.

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Know Your Car—Know Your Buyer

MR. Salesman, you are not a good salesman unless you understand your car. You should be familiar with every detail of design; with every process of manufacture and with every particular of the materials entering into the makeup of it. You may say that "I have been a successful salesman for the last 2 years and have made a great success of my business and consequently am a good salesman." This may all be true, but any one could pass as a good salesman of cars during the last 3 or 4 years because it has mostly been a matter of fill out orders and receive deposits as well as promise deliveries. Where the demand exceeds the supply salesmanship has little prominence. The last 3 or 4 years have only in a few cases brought the real salesman test to the front. It is when competition gets close that supply exceeds demand and the market lags that salesmanship is needed.

DURING the last year the hardest work of many salesmen has been to satisfy the buyer on the equipment features of the car. The selling of the car, that is, the chassis and body, has been easy—it was not selling at all but merely filling out an order—but the big salesman has stuck on the matter of a top or a glass front or perhaps a windshield. This shows the caliber of the salesman. He cannot even sell a good windshield and in a few cases he has not even been able to give one away with his car. This gives a glimpse of the true merits of salesmanship. When the arguments of selling a car come to the relative merits of different headlights or horns it is time that the salesman familiarized himself with the real merits of the car and forgot about the accessories. The salesman should sell cars and not headlights, or trunk racks, or tops, or windshields.

WHEN a buyer selects a certain car because he can get a windshield thrown in and does not buy another car because the windshield is not thrown in, it means that there is a very poor salesman in the place where the windshield is not given away. Let us call the salesman who had not the windshield to give away Salesman No. 1 and the one who had the windshield to give away Salesman No. 2. No. 1 lost the sale on a matter of equipment. That was what the buyer apparently talked. The buyer seemed to have it all his own way and set the line of argument, the salesman being merely a passive quantity to answer questions. That was poor salesmanship. The salesman should be the active factor. He should, in making a sale, lead the buyer to the good points in his car and so focus the buyer's attention instead of letting the buyer do all of the leading. A good salesman when he gets hold of a buyer who wants to hinge a sale on the present of a gas tank with a car should immediately begin an analysis of the merits of his car, and show him that the paltry outlay for a gas tank is not to be considered with the expense of operating a poor machine, which before it is a week old may have to be repaired.

THE real test of salesmanship lies in two things—know your car and know your buyer. If you do not know your car you cannot sell it, you may give it away if an anxious one, who wants immediate delivery, is not already picked up by some rival concern. You must also know your buyer. To know your buyer means ability to estimate men, to gauge their character, and also a conscious or unconscious knowledge of the science of psychology, which is the science of the operation and working of the minds. You would not try to fly an aeroplane without a knowledge of winds, the laws and conditions which govern them, and the laws of the air. You may have to study these by reading on the science of air and winds in books; you may have gained the knowledge of them intuitively from your father when a boy; or you may have gained it by experience along other lines. You may not be conscious of the fact that you are in possession of the knowledge of air currents, whether you are conscious of your possession of such knowledge or not makes little difference so long as you really have the knowledge. The big thing is to know what to do with the aeroplane and when to do it. That is what saves your life.

SO it is with psychology: Some people have studied it in colleges, others have learned it from their parents from year to year; and others have gained it by very costly experience in dealing with the public. No matter how it is obtained, and no matter whether you are conscious that you know it or not, the main thing is that you must have it, otherwise you are entirely incompetent to handle the customer, who has to be convinced that your product is better than that of your competitor. This work is true salesmanship.

THE biggest factor in every sale is the buyer. The ego is the mountain. Every buyer knows that there are half a dozen cars that are good enough for him and that will give him every satisfaction, and when it comes to buying in nine cases out of ten the salesman who loses out will have lost out because he has irritated the buyer, he has infringed on the sacred precincts of his ego, his self. How can the salesman handle that buyer unless he knows something about the workings of his mind, because it is the mind that controls the buyer. The mind operates in accordance with certain laws just as the flow of waters in the ocean is obedient to the laws of nature, just as night follows day and summer winter. It is as sensible for a lawyer, entirely unfamiliar with the statutes of the land, to try practising law as for a salesman unfamiliar with the laws of the mind to try to sell cars. Both are failures. Each can give away whatever he has to dispose of, but when it comes to really selling both are failures and will be classed as such by the employer and the public.

THE first thing that makes a lasting impression on a buyer is the thorough knowledge of the car by the salesman. When a buyer asks a salesman a certain question about the car and the salesman has to ask the manager or the head repair man or the shop superintendent the confidence of the buyer in the salesman is wrecked. Immediately the mind of the buyer gets busy, consciously or unconsciously. A feeling of doubt arises. The salesman does not know his car and how in the world can the buyer ever hope to know it from such a teacher. A buyer never comes to see a car unless he wants to know something about the car, and how can he be expected to until he is given all the information desired. A good salesman, to hold the confidence of a buyer, must know his car and he should also know the car of his greatest rival. It is only by knowing both cars that comparisons between them can be justly made. It is ignorance of the other car that gives rise to knocking, and knocking always hurts the knocker first and worst, the past has more than demonstrated.

GOODRICH WILL MAKE TIRES IN FRANCE

PARIS, Dec. 15—In order to supply the European market, the B. F. Goodrich Co. has decided to manufacture tires in France. For this purpose the European company has just secured possession of a large factory at Colombes, near Paris, recently vacated by the now defunct Krieger Gasoline-Electric Co. With a total area of 30,000 square yards the space available is sufficient for a very large production. It is expected that the new factory will be in working condition early in the spring, and will be controlled by engineers and foremen from the Akron establishment. When in full working order it will supply the whole of the European market, comprising France, Italy, England, Germany and other outlying countries. Not only will freight charges be avoided, but the high duty at present paid to bring American tires into most European countries will be removed. The company has had a selling branch in London for several years, and about 3 years ago opened a selling branch in Paris, primarily for the convenience of American tourists who were unable to use French sizes on their American rims. Since then the business has grown to such an extent that the supplying of tourists is a mere side issue. In France the Goodrich company has had considerable success with the taxicab companies.

PORTOLA RACES POSTPONED

San Francisco, Cal., Dec. 19—Special telegram—Once again the Portola road races have been postponed, but this promises to be the last postponement, as the affair now is under the sole management of Dick Ferris, who has been sanctioned by the Oakland and San Francisco motor car representatives to hold the contest and who has put up a $12,000 bond to insure the pulling off of the contest. The event is to be held over the San Leandro course on Washington's birthday and to be known as the Oakland-Panama Pacific road race. The events are to be the same as scheduled for January 2, and Ferris announces that Los Angeles dealers will enter the Fiat, Isotta, Apperson, Simplex, Pope-Hartford, Only, Mercer, Maxwell and Staver-Chicago. Local men are enthusiastic over the new plans for the races and promise several entries.

INSURANCE COMPANY INVOLVED

Indianapolis, Ind., Dec. 19—Efforts are being made by several stockholders to have a receiver appointed for the Automobile Insurance Co. of America, organized little more than 1 year ago and which has its headquarters in this city. David M. Parry, who also is president of the Parry Automobile Co., now in receivership proceedings, is president of the insurance company. The original suit for receiver was filed a few days ago in the superior court by Dr. Orien S. Miller, of St. Louis, who charged that directors of the company

American Rubber Concern Completes Plans for Establishing Plant Near City of Paris

were about to turn the property over to the Federal Union Surety Co. at the rate of approximately 35 cents on the dollar. He stated that he had paid $28,750 and given notes for $21,250 for 2,500 shares of stock.

Miller asked for a receiver, that the directors be enjoined from transferring the property, a temporary restraining order being granted, and for the cancellation of his notes. Intervening petitions have now been filed by David S. Gay and S. G. Gough, of Winchester, Ky., and Joyce & Co., of Chicago, the charges being practically the same as those made by Miller with the exception that Gay charges the directors arranged to pay an unreasonable commission for the sale of the stock to the Federal Union Surety Co. and that certain stockholders, names not given, were preferred by the cancellation and return of their stock subscriptions.

The insurance company has an authorized capitalization of $1,000,000, but, according to Miller, was unable to dispose of the $300,000 worth of stock necessary to do an insurance business under Indiana laws.

Indianapolis, Ind., Dec. 21—John M. Hall has been appointed receiver for the Automobile Insurance Co. of America and the company is restrained, pending final hearing, from disposing of its property by the superior court. Judge Collier said he believed an attempted transfer of property by the directors was illegal. The Union Trust Co., receiver for the Parry Automobile Co., has asked the superior court for permission to continue the business until the creditors can organize and take over the property under the holding company.

BUFFALO CLUB ELECTION

Buffalo, N. Y., Dec. 19—The annual meeting and election of the Automobile Club of Buffalo, which was held here tonight in Convention hall, brought out the largest indoor gathering of motorists ever held in this city. Of the organization's 2,084 members, there were more than half present. There was no contest, and, with two exceptions, resulted in the retention of the 1910 board. The result of the balloting was as follows: President, Laurens Enos; vice-president, Harry Thorp Vars; treasurer, Donald Mackay; secretary, Dai H. Lewis; board of directors, Charles Clifton, E. R. Thomas, George C. Diehl, M. M. Wall, John G. H. Marvin, J. H. McNulty and Loran L. Lewis, Jr. The annual reports showed the club to be in an extremely prosperous condition. A feature of the meeting was the reading of a report on the Automobile Club of Buffalo's country home at Clarence, N. Y., which is rapidly nearing completion. This was accompanied by many pictures, which were conveniently placed about the hall, showing the project in its various stages of construction. The report was received with much interest and enthusiasm. After the business meeting, refreshments were served and the entertainment committee, of which Gustave C. Miller is chairman, took charge and rounded out the evening with a fine program.

The directors of the Buffalo Automobile Trade Association at a recent meeting elected the following officers: President, John J. Gibson; vice-president, George Ostendorf; treasurer, Ralph E. Brown; secretary, A. W. Meyer.

OLDFIELD AND OTHERS SUSPENDED

New York, Dec. 21—Special telegram—The contest board of the A. A. A. has taken definite action against certain drivers and others participating in unsanctioned meetings during the past season. Those disqualified until January 1, 1912, are the following: Barney Oldfield, and his four racing cars; Leslie Henry, and the Pacific Coast Motor Racing Association; J. Alex. Sloane, manager of Oldfield; the Ascot Park race track; J. R. Kittle, Louis Arms, Williams, a Los Angeles agent; Henry Koch, William Carlson, W. H. Faust, Henry Butley and Condit, another agent, all of whom took part in the recent Ascot Park meet; Charles F. Stamps, L. H. Mellus and W. Gray, who acted as officials at the meet, received a similar sentence, while E. Roger Stearns and Ben. Kerscher were suspended for a year, and George H. Clark for 2 years, the latter because of his driving upder an alias. The cars entered and used by the various banned drivers are specifically barred until 1912.

As an additional penalty upon Oldfield, the board has notified the Automobile Club of America of its action for transmission to the international body at Paris, from which it will be sent to the various clubs of the world.

The board also paid its respects to the unsanctioned meet held October 1-9 at Norfolk, Va. J. E. Sheldon, Louis S. Hallowell, the Coburn Motor Car Co., George Edwards and Edward Allen, who took part in the meeting were disqualified for 1 year. The Maytag-Mason Motor Co., which was disqualified for participating in an unsanctioned meet at Boone, Iowa, was reinstated.

OFFICERS MUST PAY MOTOR BILLS

Washington, D. C., Dec. 20—Special telegram—Officers of the army can no longer hire motor cars for field service, unless willing to stand the expense themselves. An order was signed yesterday in the division of militia affairs in the war department, providing that "the cost of hiring a motor car in connection with the militia field service is not a proper charge against the funds apportioned among the several states and territories."

GARDEN DISPLAY TO SHOW YEAR'S PROGRESS

NIGHT VIEW OF THE PARIS SALON, WITH ALL THE LIGHTS TURNED ON

NEW YORK, Dec. 19—While Al Reeves and the other officials of the A. L. A. M. are busily engaged preparing for the Madison Square garden show, Charles E. Duryea, who boasts the title of special technical correspondent of the A. L. A. M., has been delving into statistics relative to the cars that will be displayed in the garden, with interesting results.

"The first question in the mouth of many buyers is that of price," says Mr. Duryea. "An average of such prices as have been made public contains a surprise, but not the surprise the buyers have been hoping and expecting. We have heard much about a reduction in price being probable, that the motor car must be cheaper, that quantity production must bring increased sales by lowering the prices. But what of the facts? At these shows will be found a goodly number of makers who exhibited in the independent show last year, and whose vehicles are smaller and lower priced than the goods of last year's exhibitors. The natural expectation is that there would be shown a great price reduction as a result of this blending of classes, but such is not the case. The average price last year, as taken from a table recently compiled was $3,227.44, while this year's average shows $3,201.23. This is a reduction, it is true, but when the thought is kept in mind that last year's price did not include the lower price vehicles it seems that 1911 shows an increase rather a decrease.

"That it has done so is not surprising when the constantly rising prices of nearly all products entering into the costs are considered. Living and labor are higher, leather and wood are scarcer and on every hand the mark of improvement instead of cheapening is to be seen. Better is demanded by the buyer, and if he gets better at the same price, he is getting the results of lower prices, although he pays the same money.

"There has been much speculation about the engine. Across the water, the laws and regulations have forced long strokes and short bores, few cylinders and high speeds. This is an abnormal growth and it is hoped will be avoided here, so it is with satisfaction that the relation of bore to stroke is noted. Last year 11.5 per cent of the engines had equal bore and stroke. This year 13.4 per cent bear this relation, a gain of 18 per cent. And this relation is to be found on cars of long proven merit and established reputation, such as the American, Amplex, Buick, Cartercar, E-M-F, Jackson, Kisselkar, Lambert, Locomobile, Maxwell, Oakland, Oldsmobile, Regal, Simplex, Speedwell, Thomas and Winton. Others of no less high reputation show very closely this relation, some employing a larger bore, as the Corbin, Elmore, Franklin, Fuller, Kisselkar, Knox, Lozier and Stevens-Duryea, while others like the Cadillac, Columbia, Flanders, Glide, Hupmobile, Marion, Moon, Mercer, Packard, Pierce-Arrow, Pullman, Rainier, and Stoddard-Dayton employ bores only slightly smaller than the strokes. The fact holds good that the large bore and short stroke engine is lighter and more compact, and therefore better suited to motor car work, and the tendency to return to sloping hoods will accentuate the value of the short-stroke engines in future, it is believed.

"The number of cylinders shows an increase. Thus last year 79.6 per cent was four-cylinder cars, whereas this year only 73.6 per cent shows them, a decrease of 7.5 per cent. This does not mean that there are fewer four-cylinder cars than a year ago, but that the sixes and twos have increased in number. It indicates that a greater variety is being offered to select from. It is very evident that no one kind or style of vehicle can meet all needs, so variety must be provided. The six-cylinder cars have increased in proportion from 18.5 per cent last year to 24.2 per cent this year, a gain of over 30 per cent. The two-cylinder cars have grown from 1.2 per cent to 2.2 per cent, an increase of over 83 per cent. The single-cylinder cars show even greater growth from .6 per cent to 1.5 per cent, a growth of nearly 150 per cent.

"In cooling means, the water shows a decrease of about 1 per cent, from 98.1 per cent to 97.7 per cent, while air-cooling has grown from 1.9 per cent to 2.3 per cent, a growth of 21 per cent. Since the air must in any event absorb the heat that the motor cannot use, it seems but rational to expect the air-cooling system to eventually win out and this growth, although of little actual amount, is of importance as indicating which way the trend is setting.

"In connection with this is the large reduction in powers shown by the average horsepower of 35.1 last year and 26.2 horsepower this year, a reduction of over 25 per cent. This reduction indicates better workmanship, better designing, less friction losses, lower fuel bills and a more satisfactory vehicle all around. It points to the fact that the motor car for daily use need not be an expensive Juggernaut, but can be of a size, power and cost to fit the average man's purse. It indicates the future use of engines which can be air-cooled and gain in simplicity thereby. Taken in connection with the price average, it shows a very great increase in effi-

COLISEUM OFFERS AN ATTRACTIVE DISPLAY

CHICAGO, Dec. 20—It begins to look now as if the Chicago show were close at hand, for S. A. Miles, general manager, has opened his headquarters in the New Southern hotel, coming on from New York and bringing with him Harry W. Perry, who will look after the interests of the commercial vehicle section of the 2-week exhibition in February. The arrival of the two was followed by the issuing of the preliminary list of exhibitors, which shows astonishing figures to the industry.

This will be Chicago's second attempt of holding a commercial show, and the prospects now are that at this time there is doubt as to the success of the venture. The business men not only in Chicago but in the central west have had their interest in the business-wagon affair aroused to the keenest pitch, while makers of these same vehicles are preparing to make a comprehensive display of what they have to offer for 1911. While there are fifty-one car concerns with space assigned to them at the present time, the chances are that at least a dozen more will be crowded into the big buildings before show time. It is estimated that upwards of 200 different models of work vehicles will be displayed, representing the value of more than a half-million dollars. In addition the gallery, second floor and annex will be filled with 150 industrial displays of parts, fittings and supplies pertaining to the motor car.

This exhibition will prove to the people of the middle west—and the whole country, for that matter—that the commercial branch of the industry has kept fully abreast of the pleasure car end, for statistics prove that at the present time there are more than 100 concerns actually manufacturing commercial cars for the market, and that there is a potential strength of 300 buyers for the possible productive capacity of upwards of 15,000 to 20,000

ciency and quality, for it is evident that the maker could not reduce his power and still maintain or increase the price unless he was able to show the ability to meet the customer's needs. It probably also indicates the passing of the speed fever, which led many buyers in the past to buy excessive powers in order that they might indulge in foolish desire for railroad speeds on the common roads.

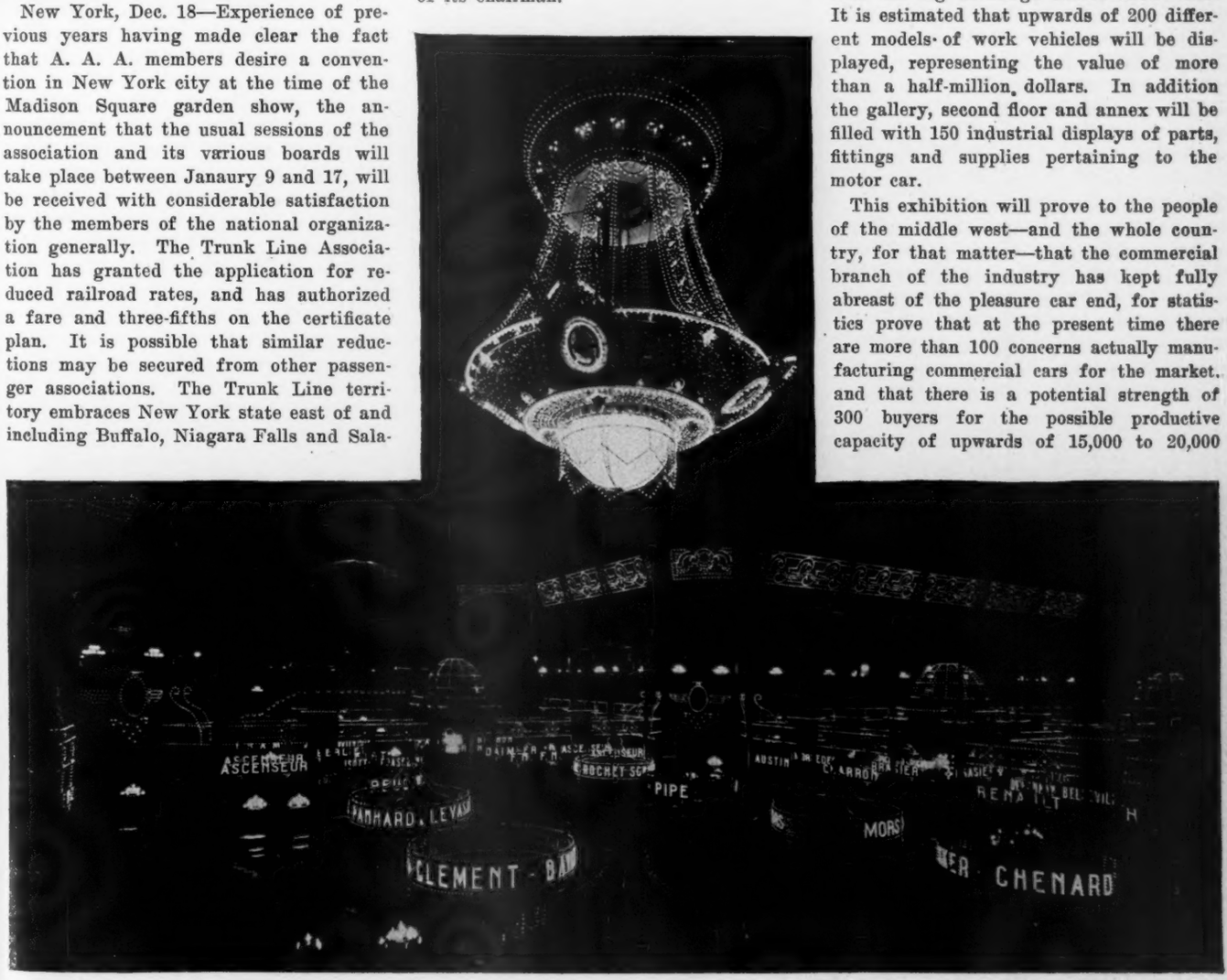
"Connected with this power decrease and price maintainance or increase is the transmission showing. Here we find sliding gears have increased from 94.5 per cent to 98.3 per cent, a growth of 4 per cent, while planetary gears have dropped from 5.5 per cent to .6 per cent. This indicates a step toward economy by using a smaller and cheaper motor and giving it a better chance to do its work, due to the sliding gear having usually three speeds forward, while the planetary has but two. It is manifest that the 1,800-pound vehicle with three speeds forward needs but little more engine power than the 1,200-pound vehicle with two speeds forward.

RATES TO GARDEN SHOW

New York, Dec. 18—Experience of previous years having made clear the fact that A. A. A. members desire a convention in New York city at the time of the Madison Square garden show, the announcement that the usual sessions of the association and its various boards will take place between Janaury 9 and 17, will be received with considerable satisfaction by the members of the national organization generally. The Trunk Line Association has granted the application for reduced railroad rates, and has authorized a fare and three-fifths on the certificate plan. It is possible that similar reductions may be secured from other passenger associations. The Trunk Line territory embraces New York state east of and including Buffalo, Niagara Falls and Salamanca; New Jersey, Pennsylvania east of and including Erie, Oil City and Pittsburg; Delaware, Maryland, District of Columbia, Virginia and West Virginia east of and including Wheeling, Parkersburg and Huntington.

Going tickets will be purchasable not earlier than January 5 nor later than January 11. Return tickets will be available up to and including January 20; and for the convenience of members the validating will be done in Madison Square garden January 10, 11, 12, 13.

While the exact program has not been decided upon, there will be meetings of the executive committee and also sessions of the four national boards through which much of the work of the association is accomplished. It will remembered that these boards—good roads, touring, legislative and contest—will be greatly amplified as a result of the recent action at the annual meeting, whereby every club in the association will be entitled to representation; furthermore, President R. P. Hooper is authorized to add 100 additional members to each board, upon the recommendation of its chairman.



GORGEOUS SPECTACLE PRESENTED AT NIGHT IN THE GRAND PALAIS, WHERE PARIS SALON WAS HELD

vehicles annually, of an approximate aggregate value of from $50,000,000 to $60,000,000.

The preliminary list of exhibitors for both weeks of the show, as announced today by Manager Miles, is as follows:

PLEASURE VEHICLE SECTION

MOTOR CARS, COLISEUM, MAIN FLOOR

Space	Name and Address
A1.	Winton Motor Carriage Co., Cleveland, O.
A2.	Buick Motor Co., Flint, Mich.
A3.	Lozier Motor Co., New York.
A4.	Chalmers Motor Co., Detroit, Mich.
A5.	National Motor Vehicle Co., Indianapolis, Ind.
A6.	Pierce-Arrow Motor Car Co., Buffalo, N. Y.
B1.	Moline Auto Co., East Moline, Ill.
B2.	Hudson Motor Co., Detroit, Mich.
B3.	Stevens-Duryea Co., Chicopee Falls, Mass.
B4.	Reo Motor Car Co., Lansing, Mich.
B5.	H. H. Franklin Mfg. Co., Syracuse, N. Y.
B6.	Olds Motor Works, Lansing, Mich.
C1.	Packard Motor Car Co., Detroit, Mich.
C2.	Thomas B. Jeffery Co., Kenosha, Wis.
C3.	F. B. Stearns Co., Cleveland, O.
C4.	E-M-F Co., Detroit, Mich.
C5.	Cadillac Motor Car Co., Detroit, Mich.
C6.	Peerless Motor Car Co., Cleveland, O.
D1.	Maxwell-Briscoe Motor Co., Tarrytown, N. Y.
D2.	Willys-Overland Co., Toledo, O.
D3.	Pope Mfg. Co., Hartford, Conn.
D4.	E. R. Thomas Motor Co., Buffalo, N. Y.
D5.	Locomobile Co. of America, Bridgeport, Conn.
D6.	Dayton Motor Car Co., Dayton, O.
E1.	Woods Motor Vehicle Co., Chicago.
E2.	Columbia Motor Car Co., Hartford, Conn.
E3.	Atlas Motor Car Co., Springfield, Mass.
E4.	Premier Motor Mfg. Co., Indianapolis, Ind.
F1.	Knox Automobile Co., Springfield, Mass.
F2.	White Co., Cleveland, O.
F3.	Matheson Motor Car Co., Wilkes Barre, Pa.
F4.	American Locomotive Co., New York.
G1.	Baker Motor Vehicle Co., Cleveland, O.
G2.	Corbin Motor Vehicle Corp., New Britain, Conn.
H1.	Elmore Mfg. Co., Clyde, O.
H2.	Haynes Automobile Co., Kokomo, Ind.
J1.	Metzger Motor Car Co., Detroit, Mich.
K1.	Mitchell-Lewis Motor Co., Racine, Wis.
L1.	Fal Motor Co., Chicago.

MOTOR CARS, COLISEUM ANNEX, FIRST FLOOR

Space	Name and Address
M1.	Brush Runabout Co., Detroit, Mich.
N1.	Studebaker Bros. Mfg. Co., South Bend, Ind.
O1.	Nordyke & Marmon Co., Indianapolis, Ind.
O2.	Streator Motor Car Co., Streator, Ill.
P1.	Inter-State Auto Co., Muncie, Ind.
Q1.	Jackson Automobile Co., Jackson, Mich.
Q2.	Bartholomew Co., Peoria, Ill.
Q3.	Babcock Electric Carriage Co., Buffalo, N. Y.

MOTOR CARS, FIRST REGIMENT ARMORY, MAIN FLOOR

Space	Name and Address
A1.	Hupp Motor Car Co., Detroit, Mich.
A2.	Waverley Co., Indianapolis, Ind.
A3.	Dorris Motor Car Co., St. Louis, Mo.
A4.	Kissel Motor Car Co., Hartford, Wis.
B1.	Selden Motor Vehicle Co., Rochester, N. Y.
B2.	W. H. McIntyre Co., Auburn, Ind.
B3.	Pierce Motor Co., Racine, Wis.
B4.	American Motor Car Co., Indianapolis, Ind.
C1.	Cartercar Co., Pontiac, Mich.
C2.	Austin Automobile Co., Grand Rapids, Mich.
C3.	Garford Co., Elyria, O.
C4.	Royal Tourist Car Co., Cleveland, O.
D1.	Anderson Carriage Co., Detroit, Mich.
D2.	Moon Motor Car Co., St. Louis, Mo.
D3.	Pullman Motor Car Co., York, Pa.
D4.	Buckeye Mfg. Co., Anderson, Ind.
E1.	Speedwell Motor Car Co., Dayton, O.
E2.	Fiat Auto Co., New York.
E3.	Diamond T Motor Car Co., Chicago.
E4.	Auburn Automobile Co., Auburn, Ind.
E5.	Benz Auto Import Co., New York.
E6.	Simplex Motor Car Co., Mishawaka, Ind.
F1.	Black Mfg. Co., Chicago.
F2.	Rauch & Lang Carriage Co., Cleveland, O.
G1.	Ohio Motor Car Co., Carthage, O.
G2.	Courier Car Co., Dayton, O.
G3.	Midland Motor Co., Moline, Ill.
G4.	Chadwick Engineering Works, Pottstown, Pa.
G5.	Staver Carriage Co., Chicago.
G6.	Schacht Motor Car Co., Cincinnati, O.
H1.	Great Western Auto Co., Peru, Ind.

MOTOR CARS, COLISEUM BASEMENT

Space	Name and Address
1.	Hupp-Yeats Electric Car Co., Detroit, Mich.
3.	Colby Motor Co., Mason City, Ia.
4.	Kenmore Mfg. Co., Chicago.
5.	Ohio Electric Car Co., Toledo, O.
6.	Enger Motor Car Co., Cincinnati, O.
8.	Cole Motor Car Co., Indianapolis, Ind.
9.	Westcott Motor Car Co., Indianapolis, Ind.
10.	Broc Electric Vehicle Co., Cleveland, O.
11.	Haberer & Co., Cincinnati, O.
12.	Middleby Auto Co., Reading, Pa.
13.	Lexington Motor Car Co., Connersville, Ind.
14.	Carriage Woodstock Co., Owensboro, Ky.
15.	B. C. K. Motor Car Co., York, Pa.
16.	Otto Gas Engine Works, Philadelphia, Pa.
17.	McFarlan Motor Car Co., Connersville, Ind.
18.	Zimmerman Mfg. Co., Auburn, Ind.

ACCESSORIES, COLISEUM ANNEX, SECOND FLOOR

Space	Name and Address
77.	Motz Clincher Tire & Rubber Co., Akron, O.
78.	Warner Mfg. Co., New York.
79.	Sprague Umbrella Co., Norwalk, O.
80.	Sprague Umbrella Co., Norwalk, O.
81.	Auto Parts Mfg. Co., Muncie, Ind.
82.	Royal Equipment Co., Bridgeport, Conn.
83.	Royal Equipment Co., Bridgeport, Conn.
84.	Muncie Gear Works, Muncie, Ind.
85.	Gemmer Mfg. Co., Detroit, Mich.
86.	Excelsior Motor & Mfg. Co., Chicago.
87.	Stromberg Motor Devices Co., Chicago.
88.	Stromberg Motor Devices Co., Chicago.
89.	Havoline Oil Co., New York.
90.	Sherwin-Williams Co., Cleveland, O.
91.	Thermoid Rubber Co., Trenton, N. J.
92.	Thermoid Rubber Co., Trenton, N. J.
93.	Cook's Standard Tool Co., Kalamazoo, Mich.
94.	Booth Demountable Rim Co.
95.	Auto Improvement Co., New York.
96.	American Ever Ready Co., New York.
97.	Homo Co. of America, Jersey City, N. J.
98.	Ross Gear & Tool Co., Lafayette, Ind.
99.	Whitney Steel Co., Muncie, Ind.
100.	Turner Brass Works, Sycamore, Ill.
101.	Edison Storage Battery Co., West Orange, N. J.
102.	Driggs-Seabury Ordnance Corp., Sharon, Pa.
103.	National Coil Co., Lansing, Mich.
104.	Link-Belt Co., Indianapolis, Ind.
105.	Stewart & Clark Mfg. Co., Chicago.
106.	Cleveland Speed Indicator Co., Cleveland, O.
107.	Empire Tire Co., Trenton, N. J.
108.	Empire Tire Co., Trenton, N. J.
109.	Western Motor Co., Logansport, Ind.
110.	Eisemann Magneto Co., New York.
111.	Eisemann Magneto Co., New York.
112.	Sparks Withington Co., Jackson, Mich.
113.	Stein Double Cushion Tire Co., Akron, O.
114.	Randall-Faichney Co., Boston, Mass.
115.	Continental Rubber Works Co., Erie, Pa.
116.	Briggs Mfg. Co., Elkhart, Ind.
117.	Star Rubber Co., Akron, O.
118.	Bosch Magneto Co., New York.
119.	Bosch Magneto Co., New York.
120.	E. B. Warner Mfg. Co., Syracuse, N. Y.
121.	Motsinger Device Mfg. Co., Pendleton, Ind.
122.	R. E. Hardy Co., Chicago.
124.	Pantasote Co., New York.
125.	Ajax-Grieb Rubber Co., New York.
126.	Ajax-Grieb Rubber Co., New York.
127.	Gilbert Mfg. Co., New Haven, Conn.
128.	J. H. Sager Co., Rochester, N. Y.
129.	Globe Mach. & Stamping Co., Cleveland, O.
130.	Adam Cook's Sons, New York.
131.	Never-Miss Mfg. Co., Lansing, Mich.
132.	Leather Tire Goods Co., Cleveland, O.
133.	Briggs & Stratton Co., Milwaukee, Wis.
134.	Atwater Kent Mfg. Works, Philadelphia, Pa.
136.	C. A. Shaler Co., Waupun, Wis.
137.	Batavia Rubber Co., Batavia, N. Y.
138.	George A. Haws, New York.
139.	Dover Stamping & Mfg. Co., Cambridge, Mass.
140.	McCue Co., Hartford, Conn.
141.	Pfanstiehl Electrical Laboratory, North Chicago, Ill.
142.	Apple Electric Co., Dayton, O.
143.	Reichenbach Laboratories Co., Chicago.
144.	Willard Storage Battery Co., Cleveland, O.
145.	Auburn Auto Pump Co., Boston, Mass.
146.	Standard Thermometer Co., Boston, Mass.
147.	Russel Motor Axle Co., North Detroit, Mich.

ACCESSORIES, COLISEUM GALLERY

Space	Name and Address
1.	Michelin Tire Co., Milltown, N. J.
2.	Lovell-McConnell Mfg. Co., Newark, N. J.
3.	Vesta Accumulator Co., Chicago.
4.	Standard Roller Bearing Co., Philadelphia, Pa.
5a.	Hayes Mfg. Co., Detroit, Mich.
5.	Herz & Co., New York.
5b.	Imperial Brass Mfg. Co., Chicago.
6.	C. T. Ham Mfg. Co., Rochester, N. Y.
7.	Jones Speedometer Co., New York.
8.	N. Y. & N. J. Lubricant Co., New York. C. A. Mezger, New York.
9.	Weed Chain Tire Grip Co., New York.
10.	Continental Caoutchouc Co., New York.
11.	Valentine & Co., New York.
12.	Wheeler & Schebler, Indianapolis, Ind.
13.	Conn. Telephone & Electric Co., Meriden, Conn.
14.	Swinehart Tire & Rubber Co., Akron, O.
15.	A. O. Smith Co., Milwaukee, Wis.
16.	Consolidated Rubber Tire Co., New York.
17.	Heinze Electric Co., Lowell, Mass.
18.	Pennsylvania Rubber Co., Jeannette, Pa.
19.	Warner Instrument Co., Beloit, Wis.
20.	Republic Rubber Co., Youngstown, O.
21.	Republic Rubber Co., Youngstown, O.
22.	McCord Mfg. Co., Detroit, Mich.
23.	Whitney Mfg. Co., Hartford, Conn.
24.	Briscoe Mfg. Co., Detroit, Mich.
25.	Joseph Dixon Crucible Co., Chicago.
26.	Morgan & Wright, Detroit, Mich.
27.	Morgan & Wright, Deroit, Mich.
28.	Standard Welding Co., Cleveland, O.
29.	American Ball Bearing Co., Cleveland, O.
30.	Hartford Rubber Works Co., Hartford, Conn.
31.	Hartford Rubber Works Co., Hartford, Conn.
32.	Timken-Detroit Axle Co., Detroit, Mich.
33.	Timken Roller Bearing Co., Canton, O.
34.	R. E. Dietz Co., New York.
35.	Diamond Chain & Mfg. Co., Indianapolis, Ind.
36.	Gray-Hawley Mfg. Co., Detroit, Mich.
37.	Wm. Cramp & Sons Co., Philadelphia, Pa.
38.	Fisk Rubber Co., Chicopee Falls, Mass.
39.	Fisk Rubber Co., Chicopee Falls, Mass.
40.	National Tube Co., Pittsburg, Pa.
41.	Badger Brass Mfg. Co., Kenosha, Wis.
42.	Veeder Mfg. Co., Hartford, Conn.
43.	Gray & Davis, Amesbury, Mass.
44.	G & J Tire Co., Indianapolis, Ind.
45.	G & J Tire Co., Indianapolis, Ind.
46.	National Carbon Co., Cleveland, O.
47.	B. F. Goodrich Co., Akron, O.
48.	B. F. Goodrich Co., Akron, O.
49.	C. F. Splitdorf, New York.
50	Gabriel Horn Mfg. Co., Cleveland, O.
51.	Goodyear Tire & Rubber Co., Akron, O.
52.	Goodyear Tire & Rubber Co., Akron, O.
53.	Long Mfg. Co., Chicago.
54.	J. H. Williams Co., Brooklyn, N. Y.
55.	Diamond Rubber Co., Akron, O.
56.	Diamond Rubber Co., Akron, O.
57.	Warner Gear Co., Muncie, Ind.
58.	A. W. Harris Oil Co., Providence, R. I.

The Show Circuit

December 12-31—Two weeks' show of Los Angeles Motor Car Dealers' Association, Los Angeles, Cal.

December 31-January 7—Grand Central Palace show, New York.

January 2-7—Importers' show, Hotel Astor, New York.

January 7-14—First week of A. L. A. M. show in Madison Square garden, New York.

January 14-25—Show in Brussels, Belgium.

January 14-28—Show of Philadelphia Automobile Dealers' Association, Philadelphia, Pa.

January 16-21—Second week of A. L. A. M. show in Madison Square garden, New York.

January 16-21—Show in Wayne pavilion, Detroit.

January 16-21—Show at Milwaukee, Wis.

January 25-28—Show in Auditorium, St. Paul, Minn.

January 28-February 4—First week of national show in Coliseum, Chicago.

February 5-11 Show at Buffalo, N. Y.

February 6-11—Second week of national show in Coliseum, Chicago.

February 13-18—Show at Winnipeg, Canada.

February 13-18—Show of Kansas City Motor Car Trade Association.

February 13-18—Show at St. Louis, Mo.

February 13-18—Show in Convention hall, Washington, D. C.

February 14-19—Show at Dayton, O.

February 15-18—Show at Grand Rapids, Mich.

February 18-25—Show at Minneapolis, Minn.

February 18-25—Show at Binghamton, N. Y.

59. Hartford Suspension Co., Jersey City, N. J.
60. Hartford Suspension Co., Jersey City, N. J.
61. Baldwin Chain & Mfg. Co., Worcester, Mass.
62. Spicer Mfg. Co., Plainfield, N. J.
63. Brown-Lipe Gear Co., Syracuse, N. Y.
64. Pittsfield Spark Coil Co., Dalton, Mass.
65. Continental Motor Mfg. Co., Muskegon, Mich.
66. Remy Electric Co., Anderson, Ind.
67. Firestone Tire & Rubber Co., Akron, O.
68. Firestone Tire & Rubber Co., Akron, O.
69. Electric Storage Battery Co., Philadelphia, Pa.
70. Oliver Mfg. Co., Chicago.
71. S. F. Bowser & Co., Fort Wayne, Ind.
72. S. F. Bowser & Co., Fort Wayne, Ind.
73. Edmunds & Jones Mfg. Co., Detroit, Mich.
74. Kokomo Electric Co., Kokomo, Ind.
75. Byrne-Kingston & Co., Kokomo, Ind.
76a. U. S. Light & Heating Co., New York.
76. C. F. Ernst's Sons, Buffalo, N. Y.

ACCESSORIES, FIRST REGIMENT BALCONY

Space Name and Address
1. Horseless Age, New York.
2. Elite Mfg. Co., Ashland, O.
3. Ajax Trunk & Sample Case Co., New York.
4. W. E. Pratt Mfg. Co., Chicago.
5. Norton Co., Worcester, Mass.
6. Perfection Spring Co., Cleveland, O.
7. Rutherford Rubber Co., Rutherford, N. J.
8. Rutherford Rubber Co., Rutherford, N. J.
9. Universal Tire Protector Co., Angola, Ind.
10. Fellwock Auto & Mfg. Co., Evansville, Ind.
11. Lutz-Lockwood Mfg. Co., Aldene, N. J.
12. Motor Parts Co., Plainfield, N. J.
13. Charles O. Tingley & Co., Rahway, N. J.
14. Barco Brass & Joint Co., Chicago.
15. Motor Vehicle Publishing Co., New York.
16. Findeisen & Kropf Mfg. Co., Chicago.
17. Atlantic Refining Co., Cleveland, O.
18. F. A. Brownell Motor Co., Rochester, N. Y.
19. Skinner & Skinner Co., Chicago.
20. Marshalltown Buggy Co., Marshalltown, Ia.
21. Simms Magneto Co., New York.
22. S. ½—K. & W. Mfg. Co., Ashland, O.
22. N. ½—Armiger Chemical Co., Chicago.
23. Garage Equipment Mfg. Co., Milwaukee, Wis.
24. S. Breakstone, Chicago.
25. K-W Ignition Co., Cleveland, O.
26. Gates-Osborne Mfg. Co., Marshalltown, Ia.
27. Frank E. Sparks, Chicago.
28. Standard Varnish Works, Chicago.

For This Winter

February 18-25—Show at Brooklyn, N. Y.
February 18-25—Show at Newark, N. J.
February 20-25—Show at Omaha, Neb.
February 20-25—Show at Cincinnati, O.
February 20-25—Show at Baltimore, Md.
February 24-27—Show at New Orleans, La.
February 25-March 4—Show at Toronto, Canada.
February 27-March 4—Show of Kansas City Automobile Dealers' Association, Kansas City, Mo.
February 27-March 4—Show at Sioux City, Ia.
March 4-11—Show at Boston, Mass.
March 6-11—Show at Des Moines, Ia.
March 13-18—Show at Cedar Rapids, Ia.
March 13-18 Show of Cleveland Automobile Dealers' and Makers' Association, Cleveland, O.
March 14-18—Show at Syracuse, N. Y.
March 14-18—Show in Auditorium, Denver, Colo.
March 15-18—Show at Louisville, Ky.
March 18-25—Show in Pittsburg, Pa.
March 25-April 1—Show of Pittsburg Automobile Dealers' Association,
March 27-31—Show of Cleveland Automobile Show Co., Cleveland, O. Pittsburg, Pa.
April 1-8—Show at Montreal, Quebec.
April 4-8—Commercial Car Automobile Dealers' Association show of Pittsburg, Pa.

29. Shawmut Tire Co., Boston, Mass.
30. Keystone Lubricating Co., Chicago.
31. John W. Blackledge Mfg. Co., Chicago.
32. Polson Mfg. Co., Buffalo, N. Y.
33. Union Auto Repair Co., Pittsburg, Pa.
34. Cycle & Auto Trade Journal, Philadelphia, Pa.
35. Motor Age, Chicago.
36. Morrison-Ricker Mfg. Co., Grinnell, Ia.
37. Troy Carriage Sunshade Co., Troy, O.
38. Model Gas Engine Works, Peru, Ind.
39. Longdin-Brugger Co., Fond du Lac, Wis.
40. Automobile, New York.

COMMERCIAL VEHICLE SECTION, FEB. 6-11, 1911

MOTOR VEHICLES, COLISEUM, MAIN FLOOR

Space Name and Address
A1. Mack Bros. Motor Car Co., Allentown, Pa.
A2. Mais Motor Truck Co., Indianapolis, Ind.
A3. U. S. Motor Truck Co., Cincinnati, O.
A4. Hart-Kraft Motor Co., York, Pa.
A5. White Co., Cleveland, O.
A6. Studebaker Bros. Mfg. Co., South Bend, Ind.
B1. Alden Sampson Mfg. Co., Pittsfield, Mass.
B2. Courier Car Co., Dayton, O.
B3. W. H. McIntyre Co., Auburn, Ind.
B4. Waverley Co., Indianapolis, Ind.
B5. Reo Motor Car Co., Lansing, Mich.
B6. Willys-Overland Co., Toledo, O.
B7. Cartercar Co., Pontiac, Mich.
B8. Grabowsky Power Wagon Co., Detroit, Mich.
B9. Garford Co., Elyria, O.
C1. Packard Motor Car Co., Detroit, Mich.
C2. Pope Mfg. Co., Hartford, Conn.
C3. Avery Co., Peru, Ind.
C4. Reliance Motor Truck Co., Owosso, Mich.
C5. Rapid Motor Vehicle Co., Pontiac, Mich.
D1. Peerless Motor Car Co., Cleveland, O.
D2. American Locomotive Co., New York.
D3. Pierce-Arrow Motor Car Co., Buffalo, N. Y.
D4. Metzger Motor Car Co., Detroit, Mich.
D5. H. H. Franklin Mfg. Co., Syracuse, N. Y.
D6. Knox Automobile Co., Springfield, Mass.
D7. Kissel Motor Car Co., Hartford, Wis.
E2. Kelly Motor Truck Co., Springfield, O.
E3. Independent Harvester Co., Piano, Ill.
E4. Adams Bros. Co., Findlay, O.
F2. Thomas B. Jeffery Co., Kenosha, Wis.
F2. General Vehicle Co., Long Island City, N. Y.
F3. Chase Motor Truck Co., Syracuse, N. Y.
F4. Saurer Motor Trucks, Chicago.
G1. Atlas Motor Car Co., Springfield, Mass.
G2. Mercury Mfg. Co., Chicago.
G3. Dayton Auto Truck Co., Dayton, O.
J 1. Chicago Commercial Car Co., Chicago.
K1. Lansden Co., Newark, N. J.
L1. Federal Motor Truck Co., Detroit, Mich.
M1. Automobile Maintenance Co., Chicago.
M2. F. B. Stearns Co., Cleveland, O.
M3. Economy Motor Car Co., Joliet, Ill.
M4. Anderson Carriage Co., Detroit, Mich.
N1. Marquette Motor Vehicle Co., Chicago.
N2. Monitor Automobile Works, Janesville, Wis.
N3. Clark Delivery Car Co., Grand Crossing, Chicago.
N4. Schmidt Bros. Co., Chicago.
R1. Brodesser Motor Truck Co., Milwaukee, Wis.
R2. Sternberg Mfg. Co., Milwaukee, Wis.
S1. Harder's Fire Proof Storage & Van Co., Chicago.

ACCESSORIES, COLISEUM GALLERY

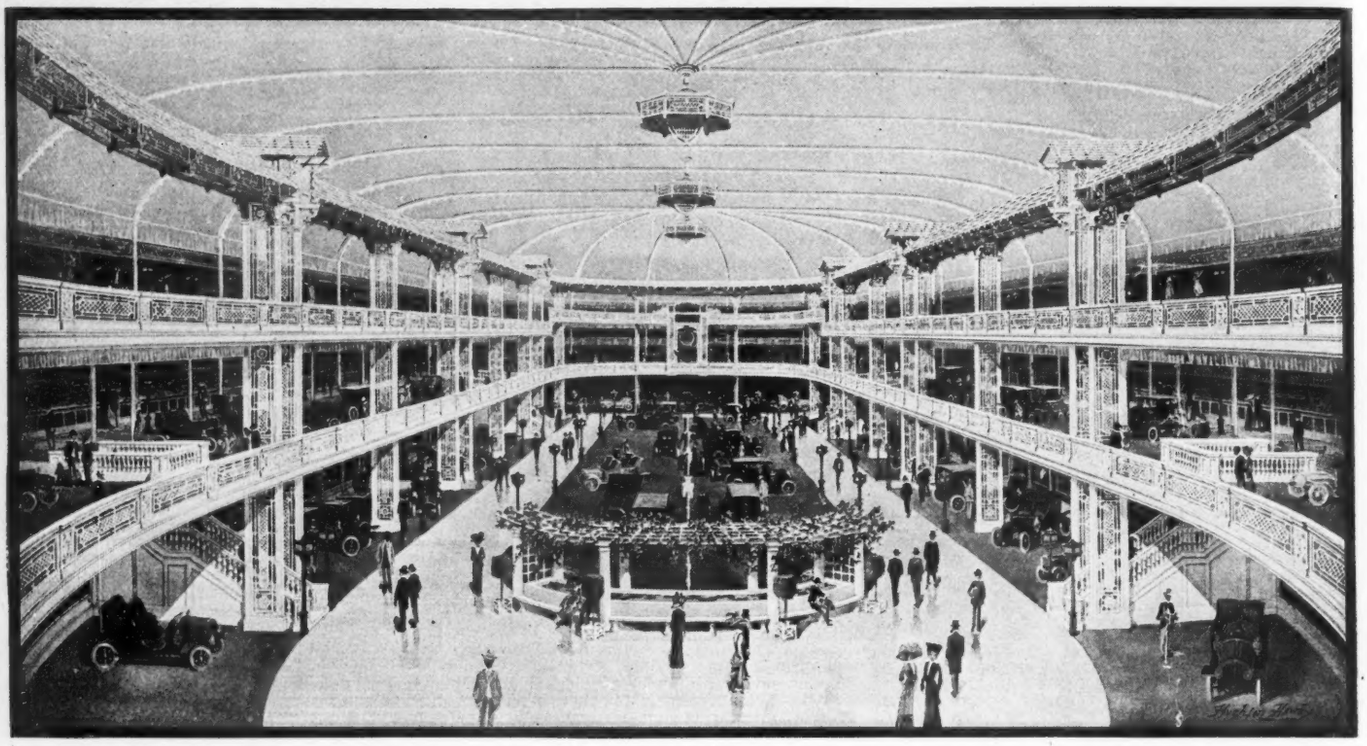
Space Name and Address
1. Michelin Tire Co., Milltown, N. J.
2. Lovell-McConnell Mfg. Co., Newark, N. J.
3. Vesta Accumulator Co., Chicago.
4. Standard Roller Bearing Co., Philadelphia, Pa.
5a. Hayes Mfg. Co., Detroit, Mich.
5. Cook's Standard Tool Co., Kalamazoo, Mich.
5b. Imperial Brass Mfg. Co., Chicago.
6. C. T. Ham Mfg. Co., Rochester, N. Y.
7. Jones Speedometer Co., New York.
8. N. Y. & N. J. Lubricant Co., New York. C. A. Mezger, New York.
9. Weed Chain Tire Grip Co., New York.
10. Continental Caoutchouc Co., New York.
11. Valentine & Co., New York.
12. Wheeler & Schebler, Indianapolis, Ind.
13. Conn. Telephone & Electric Co., Meriden, Conn.
14. Swinehart Tire & Rubber Co., Akron, O.
15. A. O. Smith Co., Milwaukee, Wis.
16. Consolidated Rubber Tire Co., New York.
17. Heinze Electric Co., Lowell, Mass.
18. Pennsylvania Rubber Co., Jeannette, Pa.
19. Warner Instrument Co., Beloit, Wis.
20. Republic Rubber Co., Youngstown, O.
21. Republic Rubber Co., Youngstown, O.
22. McCord Mfg. Co., Detroit, Mich.
23. Whitney Mfg. Co., Hartford, Conn.
24. Briscoe Mfg. Co., Detroit, Mich.
25. Joseph Dixon Crucible Co., Chicago.
26. Morgan & Wright, Detroit, Mich.
27. Morgan & Wright, Detroit, Mich.
28. Standard Welding Co., Cleveland, O.
29. American Ball Bearing Co., Cleveland, O.
30. Hartford Rubber Works Co., Hartford, Conn.
31. Hartford Rubber Works Co., Hartford, Conn.
32. Timken-Detroit Axle Co., Detroit, Mich.

33. Timken Roller Bearing Co., Canton, O.
34. R. E. Dietz Co., New York.
35. Diamond Chain & Mfg. Co., Indianapolis, Ind.
36. Gray-Hawley Mfg. Co., Detroit, Mich.
37. Wm. Cramp & Sons Co., Philadelphia, Pa.
38. Fisk Rubber Co., Chicopee Falls, Mass.
39. Fisk Rubber Co., Chicopee Falls, Mass.
40. National Tube Co., Pittsburg, Pa.
41. Badger Brass Mfg. Co., Kenosha, Wis.
42. Veeder Mfg. Co., Hartford, Conn.
43. Gray & Davis, Amesbury, Mass.
44. G & J Tire Co., Indianapolis, Ind.
45. G & J Tire Co., Indianapolis, Ind.
46. National Carbon Co., Cleveland, O.
47. B. F. Goodrich Co., Akron, O.
48. B. F. Goodrich Co., Akron, O.
49. C. F. Splitdorf, New York.
50. Gabriel Horn Mfg. Co., Cleveland, O.
51. Goodyear Tire & Rubber Co., Akron, O.
52. Goodyear Tire & Rubber Co., Akron, O.
53. Long Mfg. Co., Chicago.
54. J. H. Williams & Co., Brooklyn, N. Y.
55. Diamond Rubber Co., Akron, O.
56. Diamond Rubber Co., Akron, O.
57. Warner Gear Co., Muncie, Ind.
58. A. W. Harris Oil Co., Providence, R. I.
59. Hartford Suspension Co., Jersey City, N. J.
60. Hartford Suspension Co., Jersey City, N. J.
61. Baldwin Chain & Mfg. Co., Worcester, Mass.
62. Spicer Mfg. Co., Plainfield, N. J.
63. Brown-Lipe Gear Co., Syracuse, N. Y.
64. Pittsfield Spark Coil Co., Dalton, Mass.
65. Continental Motor Mfg. Co., Muskegon, Mich.
66. Remy Electric Co., Anderson, Ind.
67. Firestone Tire & Rubber Co., Akron, O.
68. Firestone Tire & Rubber Co., Akron, O.
69. Electric Storage Battery Co., Philadelphia, Pa.
70. Oliver Mfg. Co., Chicago.
71. S. F. Bowser & Co., Ft. Wayne, Ind.
72. S. F. Bowser & Co., Ft. Wayne, Ind.
73. Edmunds & Jones Mfg. Co., Detroit, Mich.
74. Kokomo Electric Co., Kokomo, Ind.
75. Byrne, Kingston & Co., Kokomo, Ind.
76a. U. S. Light & Heating Co., New York.

ACCESSORIES, COLISEUM ANNEX, SECOND FLOOR

Space Name and address
77. Motz Clincher Tire & Rubber Co., Akron, O.
78. Warner Mfg. Co., New York.
79. Buda Co., Chicago.
80. Garage Equipment Mfg. Co., Milwaukee, Wis.
81. Auto Parts Mfg. Co., Muncie, Ind.
82. Royal Equipment Co., Bridgeport, Conn.
83. Royal Equipment Co., Bridgeport, Conn.
84. Muncie Gear Works, Muncie, Ind.
85. Gemmer Mfg. Co., Detroit, Mich.
86. Excelsior Motor & Mfg. Co., Chicago.
87. Stromberg Motor Devices Co., Chicago.
88. Stromberg Motor Devices Co., Chicago.
89. Havoline Oil Co., New York.
90. Cook's Standard Tool Co., Kalamazoo, Mich.
91. Thermoid Rubber Co., Trenton, N. J.
92. Thermoid Rubber Co., Trenton, N. J.
93. Power Wagon, Chicago.
94. Horseless Age, New York.
95. Auto Improvement Co., New York.
96. American Ever Ready Co., New York.
97. Homo Co. of America, Jersey City, N. J.
98. Ross Gear & Tool Co., Lafayette, Ind.
99. Whiteley Steel Co., Muncie, Ind.
100. Turner Brass Works, Sycamore, Ill.
101. Edison Storage Battery Co., West Orange, N. J.
102. Driggs-Seabury Ordnance Corp., Sharon, Pa.
103. National Coil Co., Lansing, Mich.
104. Link-Belt Co., Indianapolis, Ind.
105. Stewart & Clark Mfg. Co., Chicago.
106. Cleveland Speed Indicator Co., Cleveland, O.
107. Empire Tire Co., Trenton, N. J.
108. Empire Tire Co., Trenton, N. J.
109. Western Motor Co., Logansport, Ind.
110. Eisemann Magneto Co., New York.
111. Eisemann Magneto Co., New York.
112. Sparks Withington Co., Jackson, Mich.
113. Stein Double Cushion Tire Co., Akron, O.
114. Stevens Mfg. Co., New York.
115. Continental Rubber Works Co., Erie, Pa.
116. Briggs Mfg. Co., Elkhart, Ind.
117. Cycle & Auto Trade Journal, Philadelphia, Pa.
118. Bosch Magneto Co., New York.
119. Bosch Magneto Co., New York.
120. E. B. Van Wagner Mfg. Co., Syracuse, N. Y.
121. Morrison-Ricker Mfg. Co., Grinnell, Ia.

GREAT ACTIVITY ON THE MINOR SHOW CIRCUIT



AS MADISON SQUARE GARDEN WILL LOOK DURING THE NEW YORK SHOW

122. Universal Tire Protector Co., Angola, Ind.
123. Findeisen & Kropf Mfg. Co., Chicago.
124. Perfection Spring Co., Cleveland, O.
125. International Metal Polish Co., Indianapolis, Ind.
126. International Metal Polish Co., Indianapolis, Ind.
127. Simms Magneto Co., New York.
128. Frank E. Sparks, Chicago.
129. H. H. Franklin Mfg. Co., Syracuse, N. Y.
130. Automatic Motor & Engineering Co., Chicago.
131. Model Gas Engine Works, Peru, Ind.
132. Model Gas Engine Works, Peru, Ind.
133. Briggs & Stratton Co., Milwaukee, Wis.
134. C. Cowles & Co., New Haven, Conn.
135. Motor Vehicle Publishing Co., New York.
136. Nathan Novelty Mfg. Co., New York.
137. Booth Demountable Rim Co.
138. Eagle Co., Newark, N. J.
139. Universal Rim Co., Chicago.
140. Carter Carburetor Co., St. Louis, Mo.
141. London Auto Supply Co., Chicago.
142. Atlas Chain Co., Brooklyn, N. Y.
143. Adams & Westlake Co., Chicago.
144. Willard Storage Battery Co., Cleveland, O.
145. Lutz-Lockwood Mfg. Co., Alden, N. J.
146. Sheldon Axle Co., Wilkesbarre, Pa.
147. Sheldon Axle Co., Wilkesbarre, Pa.

MOTOR CYCLE SECTION, COLISEUM ANNEX

Space Name and Address
O1. Harley-Davidson Motor Co., Milwaukee, Wis.
O2. Excelsior Motor & Mfg. Co., Chicago.
O3. Aurora Automatic Machinery Co., Chicago.
O4. Pope Mfg. Co., Hartford, Conn.
O5. Hendee Mfg. Co., Springfield, Mass.
O6. Emblem Mfg. Co., Angola, N. Y.
O7. Motorcycling, Chicago.
O8. Pontiac Motorcycle Co., Pontiac, Mich.
O9. Detroit Motorcycle Mfg. Co., Detroit, Mich.
O10. Motorcycle Publishing Co., New York.
O11. N. S. U. Motor Co., New York.
O12. Eclipse Machine Co., Elmira, N. Y.
P1. Reading Standard Co., Reading, Pa.
P2. American Motor Co., Brockton, Mass.
P3. Wagner Motor Cycle Co., St. Paul, Minn.
P4. Bicycling World, New York.
P5. Merkel-Light Motor Co., Pottstown, Pa.
R2. Reliance Motorcycle Co., Owego, N. Y.
R3. Edwards-Crist Mfg. Co., Chicago.
R4. Miami Cycle & Mfg. Co., Middletown, O.
R5. New Era Auto-Cycle Co., Dayton, O.
R6. Minneapolis Motorcycle Co., Minneapolis, Minn.
R7. Pierce Cycle Co., Buffalo, N. Y.

MILWAUKEE, Wis., Dec. 19—The first drawing for space at the third annual Milwaukee motor show, to be held this year by the Milwaukee Automobile Dealers' Association with the co-operation of the Milwaukee Automobile Club, indicates that the show will be far greater in scope and size than any previous exposition. The drawing was held at the Auditorium on December 15 and representatives of nearly 100 cars, twelve commercial cars and a large number of accessory dealers were awarded space, demanding most of the 95,000 square feet offered by the main hall and corridors, as well as the smaller halls, seating 1,200 and 1,500 each. The commercial car exhibits will be confined to the basement directly under the main hall. It is planned to provide 15,000 additional feet of space for accessories by erecting a temporary gallery over the permanent parquet seat section surrounding the arena of main hall. This gallery will be 24 feet wide and 600 feet long.

PROSPECTS AT OMAHA

Omaha, Neb., Dec. 19—The directors of the Omaha Automobile Show Association met last week and prepared a plat of the auditorium for the show which opens February 20. Later all of the members of the association met and drew for spaces. There was a general demand for more space, so that it was decided to exhibit the trucks in the basement. This will leave the whole floor of the large auditorium for the exhibition of pleasure vehicles. It was hoped to arrange it so that all of the cars could be exhibited on this floor, but there were too many pleasure cars to be shown. The Johnson-Danforth Co., which now is handling the Avery truck, applied for membership and the privilege of exhibiting, and was admitted. This makes a total of twenty-nine car agents and five general accessories dealers who will exhibit. In addition a dozen more dealers in tops, tires, and other accessories have applied for space, and if possible will be accommodated.

ALL DETROIT SPACE ALLOTTED

Detroit, Mich., Dec. 19—With the annual show of the Detroit Automobile Dealers' Association nearly a month away, every inch of the 30,000 square feet of floor space has been allotted, and Manager Walter Wilmot already has a large force of men and girls at work preparing the $20,000 worth of decorations under the direction of Designer Fred Buelow.

Mr. Wilmot returned last week from an inspection trip east, where he picked up a number of good suggestions that will be embodied in the Detroit show. His one regret is that the space available is not sufficient to take care of all the applicants. At the second drawing last Thursday night representatives of about twenty concerns, with demands for 9,600 square feet, were on hand, while only 4,000 square feet remained. Naturally many of them were disappointed, but by cutting down on some of the allotments Mr. Wilmot hopes to take care of nearly all those who wish to exhibit. Arrangements also are being made to bring here a few of the best features of the New York show.

"In the matter of new and unique models and the latest ideas in motor construc-

EXHIBITORS SECOND WEEK OF GARDEN SHOW

MAIN FLOOR

1A F. B. Stearns Co.
2A R. L. Morgan Co.
3A Pierce-Arrow Motor Car Co.
4A Waverley Co.
5A Knox Automobile Co.
6A Hupp-Yeats Electric Co.
7A Peerless Motor Car Co.
8A Metzger Motor Car Co.
9A Autocar Co.
10A Reliance Motor Truck Co.
11A Rapid Motor Vehicle Co.
12A Alden Sampson Mfg. Co.
13A Grabowsky Power Wagon Co.
14A Lansden Co.
15A Studebaker Automobile Co.
16A White Co.
17A Packard Motor Car Co.
18A Mack Bros. Motor Car Co.
19A American Locomotive Co.
20A General Vehicle Co.
21A Anderson Carriage Co.

ELEVATED PLATFORM

101A Buick Motor Co.
102A Cartercar Co.
103A Pope Mfg. Co.
105A H. H. Franklin Mfg. Co.
106A Reo Motor Car Co.
107A Willys-Overland Co.
113A Brush Runabout Co.
114A Atlas Motor Car Co.
115A Randolph Motor Car Co.
116A W. H. McIntyre Co.
117A Garford Co.
118A Ward Motor Vehicle Co.
119A Kissel Motor Car Co.
122 Goodyear Tire & Rubber Co.
123 Whitney Mfg. Co.
124 Veeder Mfg. Co.
125 Hartford Rubber Works Co.
126 Badger Brass Mfg. Co.
127 B. F. Goodrich Co.
128 Diamond Rubber Co.
129 C. F. Splitdorf.
130 Gray & Davis.
131 G & J Tire Co.
132 Morgan & Wright.
133 National Carbon Co.
134 Light Mfg. & Foundry Co.
135 Baldwin Chain & Mfg. Co.
136 Phineas Jones & Co.
137 A. O. Smith Co.
138 National Tube Co.
139 Diamond Chain & Mfg. Co.
140 Jones Speedometer Co.
141 N. Y. & N. J. Lubricant Co.
142 C. A. Mezger, Inc.
143 Weed Chain Tire Co.
144 Continental Rubber Works.
145 Wheeler & Schebler.
146 Pennsylvania Rubber Co.
147 Remy Electric Co.
148 Consolidated Rubber Tire Co.
149 Randall-Faichney Co.
150 United States Light & Heating Co.
151 Republic Rubber Co.
152 Conn. Tel. & Electric Co., Inc.
153 Chandler Co.
154 Columbia Nut & Bolt Co., Inc.
155 Coes Wrench Co.
156 Hartford Suspension Co.
157 Edmunds & Jones Mfg. Co.
157A Adam Cook's Sons.
158 Morrison-Ricker Mfg. Co.
159 J. H. Lehman Mfg. Co.
161 Chas. E. Miller.
162 A. W. Harris Oil Co.
163 Standard Roller Bearing Co.
164 Firestone Tire & Rubber Co.
165 Oliver Mfg. Co.
166 Timken Roller Bearing Co.
167 Timken-Detroit Axle Co.
168 Pittsfield Spark Coil Co.
169 Spicer Mfg. Co.
170 Brown-Lipe Gear Co.
171 Swinehart Tire & Rubber Co.
172 Warner Instrument Co.
173 J. H. Williams & Co.
174 Kokomo Electric Co.
175 Warner Gear Co.
176 Standard Welding Co.
177 American Ball-Bearing Co.
178 Fisk Rubber Co.
179 A. R. Mosler & Co.
180 Gabriel Horn Mfg. Co.
181 Castle Lamp Co.
182 Joseph Dixon Crucible Co.
183 Valentine & Co.
184 Heinze Electric Co.
185 Vacuum Oil Co.
186 Briscoe Mfg. Co.
187 Wm. Cramp & Sons Co.
189 R. F. Dietz Co.
190 Herz & Co.
191 S. F. Bowser & Co.

BALCONY

223 Columbia Lubricants Co. of N. Y.
224 Bosch Magneto Co.
225 Michelin Tire Co.
226 Lovell-McConnell Mfg. Co.
227 Elect. Storage Battery Co.
228 Continental Caoutchouc Co.
229 Eisemann Magneto Co.
230 Stewart & Clark Mfg. Co.
231 Empire Tire Co.
232 Thermoid Rubber Co.
233 Vesta Accumulator Co.
234 New Departure Mfg. Co.
235 Link Belt Co.
236 Hoffecker Co.
237 Lebanon Steel Casting Co.
239 Apple Electric Co.
240 Turner Brass Works.
241 Auto Improvement Co.
242 American Ever Ready Co.
243 Stromberg Motor Devices Co.
244 Muncie Gear Works.
245 Gemmer Mfg. Co.
246 Excelsior Motor & Mfg. Co.
247 Warner Mfg. Co.
248 Motz Clincher Tire & Rubber Co.
249 Miller Rubber Co.
250 Livingston Radiator & Mfg. Co.
251 Star Rubber Co.
252 Royal Equipment Co.
253 Driggs-Seabury Ordnance Corp.
254 Cleveland Speed Indicator Co.
255 H. W. Johns-Manville Co.
256 Stein Double Cushion Tire Co.
257 Edison Storage Battery Co.
259 Booth Demountable Rim Co.
260 George A. Haws.
261 Homo Co. of America.
262 E. B. Van Wagner Mfg. Co.
283 Parker Motor Co.
284 Ross Gear & Tool Co.
285 Crucible Steel Co. of America.
286 Standard Thermometer Co.
287 Isaac G. Johnson & Co.
289 Whitlock Coil Pipe Co.
291 Briggs Mfg. Co.
292 Stevens Mfg. Co.
293 Orlando W. Young.
295 Newark Rivet Works.

CONCERT HALL

302 Hayes Mfg. Co.
303 Havoline Oil Co.
304 Hess-Bright Mfg. Co.
306 Peter A. Frasse & Co.
308 Sparks-Withington Co.
309 Frost Gear & Tool Machine Co.
310 Willard Storage Battery Co.
312 Vanadium Metals Co.
314 Western Tool & Forge Co.
318 Cupror Co.
319 Atlantic Refining Co.
320 United Steel Co.
321 Vanadium Sales Co.
322 Century Rubber Trading Co.
323 Howard Demountable Rim Co.

SECOND TIER

401 Wright Wrench & Forging Co.
407 L. V. Fletcher & Co.
412 Philadelphia Steel Forge Co.
415 International Metal Polish Co.
415B Calmon Asbestos & Rubber Wks.
419 E. M. Benford.
420 C. A. Willey Co.
423 Automobile Tire Co.
426 Reinhold Noflux Aluminum Solder Co.

BASEMENT

500 New York Sporting Goods Co.
501 Merchant & Evans Co.
502 Newmastic Tire Co.
503 Keystone Steel Casting Co.
506 Electric Speedometer & Dynamometer Mfg. Co.
507 Hydraulic Oil Storage Co.
508 Novelty Mfg. Co.
509 Kilgore Mfg. Co.
510 Garage Equipment Mfg. Co.
511 Dorian Remountable Rim Co.
512 R. M. Hollingshead Co.
518 North East Electric Co.
526 Fegley Tire Chain Co.
536 Fay Machine Tool Co.
539 Fedders Mfg. Works.
540 Randerson Auto Parts Co.
541 Perfection Spring Co.
543 Star Starter Co.
543A Lefever Arm Co.
544 Wayne Oil Tank & Pump Co.
545 Joseph Tracy.
546 Ernest Flentje.
547 N. B. Arnold.
548 Troy Carriage Sun Shade Co.
549 Ajax Trunk & Sample Case Co.
550 Post & Lester Co.
551 Motor Print Co.
552 Motor Vehicle Publishing Co.
553 Gotham Aluminum Solder Co.
553A Luce Mfg. Co.
554 John T. Stanley.
555 Motor.
556 Julius King Optical Co.
557 J. L. Gibney & Bro.
558 Horseless Age.
559 Fred Robinson.
560 H. S. M. Auto Switch Co.
561 Power Wagon Publishing Co.
564 Scranton Auto Equipment Co.
565 William P. Miller's Sons.
566 P. Rielly & Son.
567 Atlas Chain Co.
568 Hilliard Clutch & Machinery Co.
570 Walter H. Foster Co.
571 Findeisen & Kropf Mfg. Co.
583 Mutual Auto Accessories Co.
584 Barthel, Daly & Miller.
585 S. Hoffnung & Co., Ltd.
586 J. S. Bretz Co.
587 Simms Magneto Co.
588 Automatic Appliance Co.
589 Nonpareil Horn Mfg. Co.
590 Lutz-Lockwood Mfg. Co.
591 U. S. McAdamite Metal Co.
592 Gus Balzer.
593 New England Automobile Journal.
595 Harry A. Allers & Co.
596 Automobile Topics.
597 A-Z Co.
598 Simonds Mfg. Co.
599 Thomas Prosser & Son.
600 Chilton Co.
601 International Engineering Co.
602 Charles D. Tingley & Co.
603 Frank H. Cross Distributing Co.
604 Charles J. Downing.
605 Eagle Co.
606 A. J. Myers, Inc.
607 Harrison Radiator Co.
608 Tuttle Motor Co.
609 Westen Mfg. Co.
610 Clayton Air Compressor Wks.
612 Keystone Lubricating Co.
617 Sheldon Axle Co.
618 Automobile Supply Mfg. Co.
619 Star Speedometer Co.
620 Valve Seating Tool Co.
622 Alfred C. Stewart Machine Works.

BALCONY

700 Bicycling World.
701 F. A. Baker & Co.
702 Hendee Mfg. Co.
703 Reliance Motorcycle Co.
704 Pontiac Motorcycle Co.
705 N. S. U. Motor Co.
706 Miami Cycle & Mfg. Co.
707 Harley-Davidson Motor Co.
708 Reading Standard Co.
709 Excelsior Supply Co.
710 Aurora Automatic Machinery Co.
711 Emblem Mfg. Co.
712 Pierce Cycle Co.
713 Consolidated Mfg. Co.
714 Merkel-Light Motor Co.
715 American Motor Co.
716 Marvel Motorcycle Co.
717 Motorcycle Pub. Co.
718 Motorcycling.
719 Eclipse Machine Co.
720 S. D. Mfg. Co.
721 Motor Car Equipment Co.
722 Wagner Motorcycle Co.
723 H. & F. Mesinger Mfg. Co.
724 New Era Auto-Cycle Co.
725 Detroit Motorcycle Mfg. Co.
726 Nathan Novelty Mfg. Co.
737 Syracuse & Elbridge Glove Co.

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tion Detroit, I am sure, will lead all other shows," said Manager Wilmot. "A number of local manufacturers, I understand, will exhibit exclusively here. That fact in itself will bring a large number of easterners to our show. The commercial car branch of the exhibit will be a revelation, owing to the great strides that have been made in that line the past year."

STATUS OF BALTIMORE SHOW

Baltimore, Md., Dec. 18—The Automobile Club of Maryland has appointed a committee of five to act jointly with a committee composed of a like number of members from the Baltimore Automobile Dealers' Association to formulate plans for the annual motor car show. The show dates as selected by the club will be from February 21 to 25, inclusive, and will be held in the Fifth Regiment armory. Just whether it will be a club or a coöperative affair is to be decided at the meeting of the two committees.

HARTFORD SPACE ALLOTTED

Hartford, Conn., Dec. 17—Spaces on the main floor of Foot Guard Armory for the forthcoming show of the Hartford Automobile Dealers' Association, which is to be held in February, the date as yet undecided, were allotted at a meeting of the association held this week. There are ten spaces on the main floor an dan elevated stage, which this season as in past years, goes to the Ford. Some spaces in the basement, galleries and two front rooms off the main floor have not as yet been given out. The show committee is authority for the statement that there are enough applications on hand to fill two large buildings. An overflow hall is under consideration. Three new members were admitted to the association—the Buick Garage Co., Hartford Garage Co. and the Electric Auto Station Co. The applications of eight other firms were tabled.

WASHINGTON ALLOTS SPACE

Washington, D. C., Dec. 17—Drawing for space in the national motor car show to be held in Convention hall during the week of February 13, was held this week, every inch of available space being taken. The hall will be divided into fifty-six spaces. The outside spaces will be single, while those in the center will be double. Thirty dealers, representing fifty-four different makes of cars, and seven supply and accessory dealers, were allotted space. There is every indication the show will be the largest and most elaborate affair of the kind ever held here.

Joy Frames Employers' Liability Law

DETROIT, Mich., Dec. 18—Henry B. Joy, president of the Packard Motor Car Co., has taken the initiative in a movement to secure the enactment of an equitable employers' liability law. Mr. Joy gave his views on the subject in an address before the members of the board of commerce last week. His talk created a good deal of discussion among the business men, and there is every prospect that his views will be embodied in a bill to be introduced in the next legislature, which meets in January. Among the suggestions offered by Mr. Joy are the following: Ground for statutory compensation should be confined to personal injury by accident arising in and out of the employment; it should be confined to personal injuries, of which accident is the approximate cause; if to industrial diseases they should be specifically enumerated. The amount to be paid an injured man should not exceed 66⅔ per cent of his wages, but should increase, in case of permanent injury, to correspond with the natural increased earning power of the injured man. The employer should contribute 75 per cent of the injury fund and the employe 25 per cent, the state to pay the cost of administration.

Briscoe Visits Detroit

Benjamin Briscoe, president of the United States Motor Co., was in the city last week, making preliminary arrangements for a trade campaign in England and Europe, restricted to pleasure cars. This will be conducted through a new company, known as the United International Motors, Ltd. Mr. Briscoe believes there is a big field for moderate-priced cars in Europe.

Assets of the bankrupt Detroit-Dearborn Motor Car Co., except the book accounts and real estate, have been sold to Vernon C. Fry for $14,800. The sale was conducted by the Detroit Trust Co., as trustee in bankruptcy. Mr. Fry represents a syndicate of capitalists, which is planning to remove the plant from Dearborn to Detroit and manufacture an entirely new car.

Among the new incorporations are the Crowe Motor Car Co., capitalized at $100,000, half of which is represented by a patent on a gasoline engine with a triple explosion in each cylinder, issued to Guy R. Price. The incorporators are Mr. Price, Walter A. Crowe, William W. McIntyre.

A new garage for Detroit electrics, known as station C, has just been opened at Woodward and Clairmount avenues. The garage is thoroughly modern and has accommodations for 60 cars.

Fay L. Faurote, publicity manager for the E. R. Thomas Motor Co., of Buffalo, for the past 3 years and known as one of the oldest advertising writers in the industry, has become identified with the local office of the Charles H. Fuller Co. and will have full charge of the copy work in this field.

Since it was announced that the Wolverine Automobile Club had arranged to have special cars attached to the regular Wolverine Limited, east bound, on December 31 and January 4, so many of the members have expressed a desire to go to New York that it has been found necessary to charter an entire train. It will be known as the Wolverine Automobile Club special and will leave Detroit, over the Michigan Central, at 3:15 p. m. January 4, half an hour in advance of the limited, reaching New York at 8:30 o'clock the following morning. The train will be made up of a baggage car, a diner and at least five Pullmans. A special rate has been made by the company. Members may invite as many friends as they please to go along. In addition to this train, special cars will be attached to the Wolverine on December 30 and January 8 for the accommodation of those who wish to go on those dates, and the same special rate will obtain.

With the New York show as the first objective point, the Warren Motor Car Co. has mapped out a pleasant little winter cruise for Driver William H. Smith. He will leave this city Tuesday morning in a stock Warren 30, accompanied by Ross Schram, of the J. Walter Thompson Co.'s advertising agency, and will head straight for Gotham by the most direct route. He will return by way of Philadelphia, in time to take in the Detroit show, it is expected. From here the car will go to Chicago and Milwaukee and will then press on westward to 'Frisco, taking in Kansas City, Des Moines and Denver. The car will be well equipped with snow shovels, vacuum bottles and the like, while Smith and Schram will be rigged out like a couple of polar explorers. The car has been christened the Warren Wolverine.

Maxwell on Winter Trip

Speaking of polar expeditions, A. V. Davis, sales manager of the Maxwell line for the United Motor Detroit Co., is prepared to relate a few experiences rivaling Dr. Cook's harrowing tales of the frozen north. With his Maxwell Q covered with ice and snow, Mr. Davis returned Wednesday afternoon from his triangular tour of the state, undertaken at the instance of Manager Robert K. Davis, who was bent on convincing the farmers of the utility of the motor car in winter. The trip was successful beyond his fondest expectations. When President Porter, of the Wolverine Automobile Club, looked the car over on its arrival at the Griswold house he found that not one of the seals he had placed on the machine before the start, December 5, had been disturbed, and Driver Davis gives his word that he experienced no tire trouble whatever, although he encountered some of the worst roads in the state. The snow was so deep in places that it almost enveloped the car, making it necessary for the driver and his mechanic, William Hirst, to shovel their way through.

The trip consumed 10 days and covered 1,015.6 miles. It required 70.5 gallons of gasoline, 20 quarts of oil and 3 quarts of water. An informal reception was tendered Driver Davis in the Wolverine Automobile Club, and he gave the members a graphic account of the trip.

The progress of the Flanders 20 nonstop tour, now on in California, is being watched with a good deal of interest here. The car is out to beat the record of 10,000 miles, held by the Maxwell, if it can. At last account the car had made 6,000 miles and the motor was running smoothly. The tour is under the auspices of the Southern California Automobile Association.

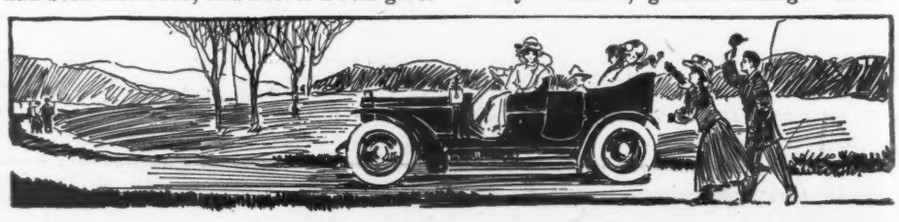
New Tour Suggested

President Porter, of the Wolverine Automobile Club, has come forward with a suggestion for a non-technical winter-summer tour from Detroit to New Orleans, and it has been received with considerable favor. As yet the matter has been discussed only informally. There is a possibility, however, that it may be taken up in earnest after the show.

Among Detroit's visitors from abroad, last week, were George Diehl, president and chief engineer of the Benz company, of Mannheim, Germany; Fritz Wurmell, assistant chief engineer of the same concern, and Carl Neumeier, president of the Rheinischen Automobile Gesellschaft, who also is identified with the Benz company. They came here for an inspection of some of the larger plants and were particularly interested in seeing the Chalmers and Packard works. While they found ideas and methods here vastly different from those that obtain in the old country, they were not prepared to say they were not as practical, and they admitted that some of the American types were pretty nearly accepted as standards of comparison in the old world.

"I think the motor car is near its stage of perfection," said Mr. Neumeier. "I refer to the passenger car, for the commercial motor vehicle will appear in almost as many forms as there are makers, inventors and users. Of course, there will be minor changes and improvements right along, but the best points of the various makes are being passed along and crystallized into one general type that will become permanent."

Teyiro Abiko, general manager of the



Tokyo Puck and the Graphic, two leading Japanese periodicals, was another distinguished visitor attracted here by the motor industry. He is gathering material for a world review for one of his publications and came here especially to get a line on the motor industry. He spent practically an entire day in the Packard plant and was greatly impressed by what he saw.

HARTFORD PUZZLED BY TRAFFIC

Hartford, Conn., Dec. 18—Mayor Edward L. Smith and Alvin Waldo Hyde, president of the board of police commissioners, addressed a meeting of the Automobile Club, of Hartford, Friday evening on traffic regulations. There is now pending before the court of common council a proposed ordinance favoring one-way streets in the center of the city and a time limit that vehicles may be allowed to stand at the curb. The unloading of coal and heavy merchandise during the middle of the day in the heart of the city also is under consideration. Neither the mayor nor the president of the police board favored one-way traffic at present, though they did express the belief that motor cars, as well as other traffic, should not be allowed to stand at the curb for any length of time. Mayor Smith told the members of the club that the highways are dedicated to and built for the people, and whatever is done by the city government would be done for the best interests of all concerned. One-way traffic on Pratt street, a narrow thoroughfare, is opposed by merchants who feel that the trade would be diverted to other streets where two-way traffic is possible. The special committee appointed by the club has conferred with the council committee and has drawn up a tentative set of rules for the regulation of the city's traffic.

ORGANIZE A ROAD BODY

Indianapolis, Ind., Dec. 19—The Indiana Good Roads Association has been organized and will present to the legislature next month a bill providing for establishing a state highway commission, a graduated vehicle and motor car tax, and for the use of convict labor in the preparation of road building material.

Officers of the new association are: President, Clarence A. Kenyon, Indianapolis; vice-presidents, Carl G. Fisher, Indianapolis; John E. Lamb, Terre Haute; Stephen Stratton, Richmond; L. Ert Slack, Franklin; Marcus Sulzer, Madison, and A. M. Beardsley, Elkhart, with four more yet to be selected; secretary-treasurer, W. J. Dobyns, Indianapolis.

Winton Upkeep Awards Announced

CLEVELAND, O., Dec. 18—A. C. Leonard, driver for W. T. Boutell, of Minneapolis, has been awarded $1,000 as first prize in the Winton six upkeep contest for 1910. Between April 1 and November 30 Leonard drove Mr. Boutell's Winton six a distance of 21,127 miles at a total repair expense of $1.40. Second money, $500, was awarded to G. W. Butler, driver for J. E. Clenny, of Chicago. Butler drove 19,015 miles on a total repair expense of 30 cents. Other prizes were awarded as follows:

Third, $250—Won by P. W. Mulford, driver for W. J. Friedlander, of Cincinnati; 18,809 miles, repair expense 30 cents.

Fourth, $150—Won by William E. Ochsie, driver for Martin Daab, Hoboken, N. J.; 17,130.9 miles, repair expense none.

Fifth, $100—Won by John J. Boyce, driver for Isaac Bacharach, of Atlantic City; 17,390 miles, repair expense $3.46.

Sixth, $100—Won by Charles A. Rice, chauffeur for L. T. Peterson, of Youngstown, O.; 15,790 miles, repair expense none.

Seventh, $100—Won by John T. Wilson, driver for W. B. Martin, of Cleveland; 14,847 miles, repair expense none.

Eighth, $100—Won by Michael Stone, driver for H. M. Cheney, of Toledo; 14,059 miles, repair expense none.

Ninth, $100—Won by William G. Hyatt, driver for S. S. Boothe, of Los Angeles; 13,526 miles, repair expense none.

Tenth, $100—Won by Guy C. Davis, driver for Horace J. Phipps, of Boston; 14,208 miles, repair expense $1.50.

The total distance driven by these ten men was 165,901.9 miles, and the total repair expense was $6.96.

The 1910 contest was the third conducted by the Winton company. Records for the whole series of contests are as follows:

Year	Cars	Miles	Expense
1908	10	65,687.4	$ 15.13
1909	10	118,503	127.30
1910	10	165,901.9	6.96
Totals	30	350,092.3	$149.39

The total distance covered is greater than fourteen times the distance around the earth at the equator. Each car averaged per contest 11,670 miles, per month 1,603.4 miles and per day 53.4 miles. The average cost for repairs in the three contests was 43 cents per 1,000 miles.

Especially interesting is the record of Butler, who won second money. In 1908 he won ninth prize and in 1909 first prize, driving the same car in each of the three contests. The full 3-year record for this car is 41,173 miles, with a total repair expense of 30 cents.

This annual contest is open to all employed drivers of Winton six cars. They are required to make monthly reports of mileage and expense, such reports being attested by the car owners. At the end of the contest both drivers and owners are required to supply affidavits covering all reports. The reports are then placed before a committee of judges, which weighs the evidence and awards the prizes.

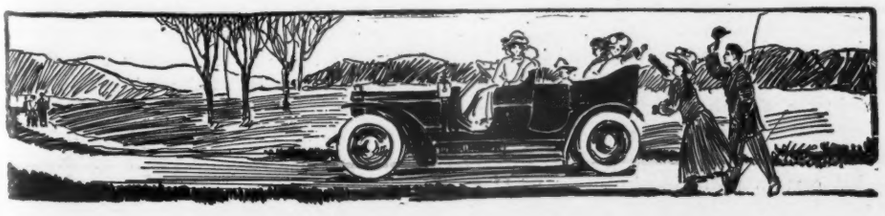
The legislative committee is composed of two members each from the following associations: Northern Indiana Good Roads Association, Indiana Rural Letter Carriers' Association, the Federated Commercial Clubs of Indiana, the Indiana Engineering Society, the Hendricks County Improvement League, the Indiana Manufacturers' Bureau, the Indianapolis Board of Trade, the Indianapolis Commercial Club, the Indianapolis Trade Association, Indiana branch of the National Conservation Association, the Indianapolis Manufacturers' Club, the Indianapolis Automobile Club, Indiana Automobile Manufacturers' Association and the Indianapolis Automobile Trade Association.

SMITH COMPANY REORGANIZED

Topeka, Kas., Dec. 18—An entirely new company is being organized for the purpose of taking over the plant and assets of the present Smith Automobile Co. and beginning operation with a clean slate. The plant, if these plans are successful, will be kept in Topeka and the output will be greatly increased. Those who are taking an active part in the formation of this proposed new company have met with considerable material encouragement and they state that they expect to have the entire amount of the stock placed within the next 10 days. Among those active in the formation of the proposed new company are F. E. Whitney, auditor of the present Smith Automobile Co., and W. B. Morris, general sales agent of the company. Topeka financial, commercial and mercantile interests have promised their coöperation in the proposed new company, according to the men who are at the head of the plan.

The proposed new company is to have a capitalization of $1,000,000, half of which will be preferred stock and the other half common stock. The preferred stock is to draw 7 per cent dividends and is to be sold at par value with a bonus of common stock, share for share. This means that the new company will have $500,000 actual paid in capital with which to purchase the Smith plant and to begin operation.

The new company is to be known as the Smith-Topeka Motor Car Co., to be incorporated under the laws of Kansas, and will continue the manufacture of the Great Smith car. The affairs of the Smith Automobile Co. were placed in the hands of a receiver only a short time ago, F. B. Clark, secretary and manager of the company, being named.



FIRE IN GABRIEL HORN PLANT

Cleveland, O., Dec. 17—The factory of the Gabriel Horn Co., 1407 East Fortieth street, was completely destroyed by fire Saturday, December 10. The loss is estimated at from $50,000 to $75,000, a great part of which was in valuable stock.

The Readers'

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

SALT CREEK SIGN BOARD

ELMHURST, Ill.—Editor Motor Age—I desire to call the attention of the signboard committee of the Chicago Motor Club relative to placing a signboard at an important point, which is at a fork in the Butterfield road about 300 feet west of the bridge crossing Salt creek. There is a little white school house at this spot. The road to the right leads to Wheaton, through York Center. It is a popular road for tourists bound for Wheaton, Naperville, or Aurora. The left fork passes through a small hamlet, Utopia, and after 2 or 3 miles of good road terminates in a dirt road. I have been told by farmers living on this left fork that many motorists would mistake this road for the branch extending to Wheaton.

I also wish to refer to the suggestion I made some time ago of painting some symbols along each route to identify it. A white circle or similar design could be painted on trees, stones, posts, or any available object along the roadway. This would make it comparatively easy to follow a route and would demand only an occasional signboard to state the mileage. —Henry F. Langhorst.

ADJUSTING PUSHRODS

Denison, Ia.—Editor Motor Age—I have read with much interest the communications in the Readers' Clearing House columns and find most all very valuable information. I also note in Motor Age, issue December 1, page 18, Mr. Maher's plan for making the pushrods on an E-M-F, Ford and other cars, adjustable. I wrote Mr. Gillespie personally my way of repairing such rods as are not originally adjustable and for the benefit of the general repairman I address this communication. To me there are two serious objections to Brother Maher's adjustment. First, you destroy the tempering of the pushrod which the factory does and which is almost impossible for the average repairman to equal. Second, you also destroy the cushion effect that the factory gets by using the fiber or rawhide plugs. While Mr. Maher's idea surely will work, the labor and expense is much greater than if the following is applied. The Metzger Motor Car Co. use on its Everett 30 a cap and jam-nut, the same being screwed on the valve stem. The jam-nut also acts as a seat for the valve spring and is grooved to receive the same, holding the spring to the center perfectly. All that has to be done is to take out the valves, cut off about 3-16 inch off the lower end and thread with a standard A. L. A. M. ⅜-inch die. Set the valve spring in the jam-nut, place the spring and jam-nut in position over the guide, turn over the motor until the pushrod is at its highest point, drop in the valve, and with an ordinary screwdriver screw the valve into the jam-nut. When screwd down far enough to receive the caps, place a piece of wood or lead under the valve at the seat which holds the valve up, turn the motor over until the pushrod drops, when the cap can then be screwed on with ease. This saves the use of a valve-lifter. Release the valve and adjust as per instructions from the factory. Generally, I have found it advisable to replace all the fibers in the pushrods with new fibers, and I find the fibers wear much longer with the large cap to strike them than when the valve stem works on them. This entire job can be done for $5 and to the driver who cares anything for a quiet, powerful motor, this will be a thing of beauty and a joy forever.—A. F. Boylan.

ANTI-FREEZING COMPOUNDS

Enterprise, Kans.—Editor Motor Age—Please tell in the Readers' Clearing House columns which is the better to use in anti-freezing compound, wood alcohol or denatured alcohol; also give the reason why—Seth Fleming.

Regarding the relative merits of denatured alcohol and wood alcohol, the following tabulations will show the freezing point of these solutions:

DENATURED ALCOHOL

Percent solution	Freezing point
10	25
20	12
30	3
40	20 below
50	35 below

WOOD ALCOHOL

Percent solution	Freezing point
5	25
10	17
15	10
20	5
25	3
30	10 below

INFORMATION WANTED

Vicksburg, Miss.—Editor Motor Age—Will Motor Age through the Readers' Clearing House tell us where we can get a special attachment for a lathe to rebore or ream and polish gas engine cylinders?—Reader.

Motor Age has no knowledge of such an attachment, and would be glad to hear from any one who might be able to help the reader in this respect.

OIL COOLING FOR CARS

Lincoln, Nebr.—Editor Motor Age—Will crude oil give as much satisfaction as a cooling solution for a radiator in winter weather?—T. L. Anthony.

Oil has been satisfactorily used for cooling in motor cars, the grade employed being the common class of machinery oil purchased at 12 cents per gallon. There is no record of the heavy crude oil being used for this work.

The writer has seen experiments conducted with oil cooling in which the standard type of radiator was used and a higher motor efficiency was obtained with the oil than with water. It is certain, however, that certain radiator conditions will have to be met with in oil cooling, because experiments have shown that radiators giving most satisfactory results for oil cooling have given poorest results for water cooling.

In one test it was found with a temperature drop of 12 degrees with oil the radiator gave a cooling effect of 700 cubic units, but when water was used only 70 per cent as much heating was radiated, in spite of the fact that the air circulation was increased. In several tests the use of oil has resulted in 50 per cent more efficiency than water. This is due to the fact that the engine was operated at a much higher temperature in the jacket without boiling. Water boils at 212 degrees Fahrenheit, and above this temperature it is hard to operate the engine.

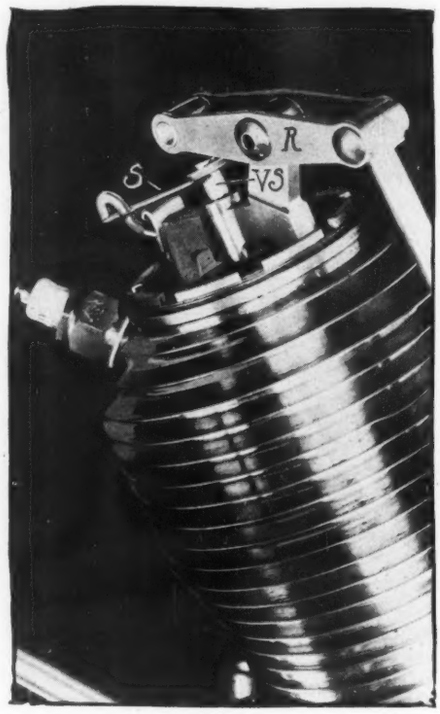


FIG. 1—CYLINDER HEAD OF SEVEN-CYLINDER GNOME MOTOR

VALVES IN GNOME MOTOR

Washington, D. C.—Editor Motor Age—Will Motor Age publish in the Readers' Clearing House a description of the location and operation of the valves in a seven-cylinder gasoline engine, revolving cylinder type, as used in aeroplanes?—H. M. Darling.

Both the seven and fourteen-cylinder

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

Gnome engines were very clearly described and illustrated in the September 8 issue of Motor Age, pages 22, 23, 24, and 25. The general details of construction, however, are again shown in Figs. 1, 2 and 3. The exhaust valve is mounted in the cylinder head as shown in Fig. 1, its seating being screwed in by means of a special box spanner wrench. The valve is operated by an overhead rocker-arm R, whose

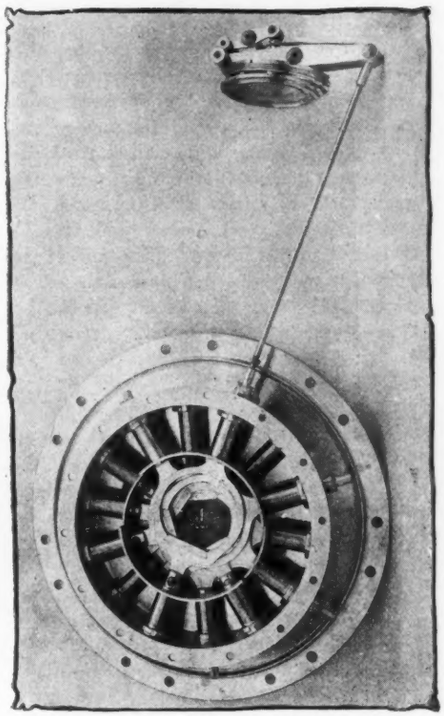


FIG. 2—SHOWING VALVE OPERATION GNOME FOURTEEN-CYLINDER ENGINE

free end comes directly in contact with the end of the valve-stem VS. As in standard motor car practice, the valve is opened by the lift of a vertical pushrod, actuated by a cam. The distinctive feature is the use of a four-blade leaf spring S with a forked end encircling the valve stems and pressing against a collar on its extremity. On the fourteen-cylinder model, the movement is reversed, Fig. 2, the valve being opened on the downward pull of the pushrod, this lifting the outer extremity of the main rocker arm, which tips a secondary smaller rocker arm in direct contact with the extremity of the valve stem. The springs are the same in each case. The intake valves N, Fig. 3, are automatic, and are mounted in the head of the piston. The valve-seating is in halves, the lower portion being made to receive the wrist pin and connection rod, and the upper portion, carrying the valve, which is screwed into it. The valve-spring S is composed of four flat blades, with the hollowed stem of the valve passing through their center and their two extremities attached to small levers calculated to give balance against centrifugal force. The springs are within the piston and are lubricated by splash from the crankchamber. They are a delicate construction, for it is necessary that they shall be accurately balanced so as to have no tendency to fly open under the influence of centrifugal force. The intake valve is withdrawn by the use of special tools through the cylinder head, the exhaust valve being first dismounted.

LIGHT VOLUME FOR HEADLIGHT

Tracy, Minn.—Editor Motor Age—Will Motor Age kindly tell me the relative merits of gas tanks and storage batteries? I can charge the battery here in my office, but would have to express the gas tank away for recharging. What capacity battery would Motor Age recommend for furnishing current for two headlights, and how many hours' service would I get? How many hours from the gas tank, and would I find the fittings for making over gas lamps to electric satisfactory?—G. W. Norris.

We would suggest your using a 6-volt, 80-ampere battery. This battery should furnish 6¼-candlepower Tungsten bulbs and 2 headlights for 35 hours' service if you are to use electricity. If you use a Prest-O-Lite outfit, these tanks are sold in three sizes and the burners employed are in three sizes. The largest tank contains 70 cubic feet of gas, and if burners are used which consume ½ cubic foot of gas per hour, the tank would furnish capacity for 70 hours continuous use. Another burner size has a capacity of ¾-cubic foot per burner per hour, and thus the lighting service is reduced 52 hours. The largest burner consumes 1 cubic foot per hour, which is 2 cubic feet per hour for both lights, so that the tank capacity will last for 35 hours. These tanks are made in two smaller sizes, namely, 40 and 30 cubic feet, respectively. The recharging cost at Prest-O-Lite branches is $3 for the large tank, $2 for the intermediate one and $1.50 for the smallest size. There is a Prest-O-Lite branch in Minneapolis.

GRAPHITE IN BEARINGS

Keokuk, Ia.—Editor Motor Age—In Motor Age, issue November 10, appeared an article entitled "Laying Up the Motor Car for Winter." At the top of page 25, first column, it is stated, "Do not use graphite grease in anti-friction bearings." As I have always used graphite mixed with grease in all my grease cups, I would ask Motor Age why it disapproves of such a lubricant.—Beverly B. Hobbs.

The function of graphite is to overcome friction. As anti-friction bearings have no friction, why use it? To be more specific, the reason is that graphite is a solid substance, whose function in plain bearings is to fill the microscopic irregularities of the rubbing surfaces. It is conceivable that in a badly made anti-friction bearing, with rough races and rough balls, the introduction of this solid substance might do no harm, as it would find a place in the interstices between the high spots which made actual contact.

If, however, the balls or rollers and the races, or sleeves, are polished as smooth as they should be, the graphite performs no legitimate function whatever. The balls or rollers must simply roll over it, just as they would over sand or any other solid material. The graphite particles are therefore crushed between the rolling elements and the races or sleeves, and, to the extent of its ability to act as a grinder, the graphite acts to crush or abrade the surfaces in contact.

Evidently the smaller the individual flakes or particles of graphite, the less damage the graphite will do. In deflocculated form the particles of graphite are so minute that careful tests have shown no appreciable damage. This is not true, however, of ordinary flake graphite, which is distinctly injurious.

SOMETIMES RIVETS LOOSEN

Madison, S. D.—Editor Motor Age—Referring to the cut and communication from W. S., Streator, Ill., on page 36 of Motor Age, issue November 17, relative to the E-M-F steering gear, I would say that sometimes the three rivets fastening the sector S become loose, giving rise to lost motion.—H. H. Frudenfeld.

TOWING A CAR

Los Gatos, Calif.—Editor Motor Age—Will Motor Age through the Readers' Clearing House inform me as to the proper manner of towing a motor car; that is, where should the rope be attached to the car, and where to the car one is towing, so that no harm will be done to either? —Subscriber.

If the road conditions are such that the car in tow must trail along directly behind the car which is towing it, tie one end of the rope to the rear end of either the right or left side member of the frame of the towing car, and the other end of the rope to the horn or front end of the corresponding side member of the frame of the car to be taken in tow. On cars with elliptic or three-quarters elliptic springs, the rope may be attached to the section of the springs which is attached directly to the frame or to the spring-bracket, and it should be attached as near to the frame as possible. The rope should

not be looped under both spring horns of the car to be towed unless a very long bite is used so that the spring horns, the protruding ends of the frame, are not bent inward should the rope be drawn taut with a jerk. Great care and skill should be exercised by the drivers of both cars when a car is being towed, especially on rough roads.

REGARDING THE GUARANTEE

Philadelphia, Pa.—Editor Motor Age—As a reader of Motor Age there is a subject I would like to see touched upon. It is a subject that concerns the industry generally, being a matter of as much importance, I believe, to the manufacturer and his agents as to the buyer himself. "What does a guarantee really amount to? Who are the responsible parties?" When a man buys a car and pays hard-earned cash for it, he certainly ought to be entitled to a binding guarantee that if, say, a spring is a little weak or some part of the engine develops a weakness, that the weak may be made strong at no expense to him. Prevailing prices are high enough to buy satisfaction. If they are not the car should not be represented to the public as being guaranteed.

A car is not fully guaranteed if the owner is called upon to pay the labor charges incident to replacing a defective part. The dealer claims, although he sold the car, he is no more responsible for the replacement of one part than another. He says he is not responsible and nobody expects him to be; if a tire blows out and yet he sold the tires, why should he be any more responsible for some other part that gives out? The manufacturer upon a

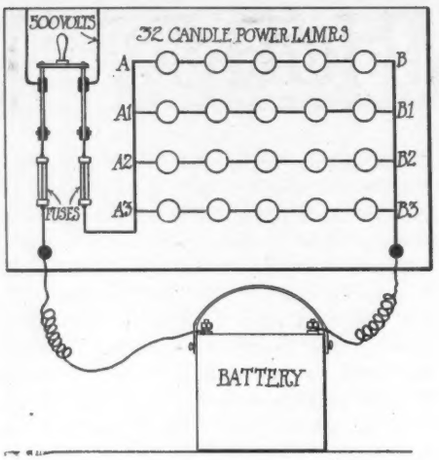


FIG. 4—USING LAMPS TO CHARGE BATTERY FROM 500-VOLT CIRCUIT

throne hundreds of miles away says, "Send me the defective parts and maybe in the course of 3 or 4 months, if the freight has been prepaid, my inspectors may grant your claim and send you another part collect." Is the owner going to keep his car out of commission all this time? No; he has another part put on by the dealer. This is where trouble comes in. The dealer thinks it is not right that his capital should be tied up in that man's car, and he accordingly sends a bill for the replaced part and the labor. The owner then says he thought he was buying a car from reliable parties; and they keep it up, with the result that the dealer loses in advance the sales of the future to that man.

In Philadelphia, I think, the motor-car houses use their own judgment in dealing with replacements. They seldom are called upon before a sale to state their terms for living up to the guarantee. A man who never has owned a car hardly would think help the industry, and I consider Motor Age the best paper devoted to motor cars in the matter of news and also because of its volume of advertising.—J. R. Curtis.

HAS BRAKE TROUBLE

Oneida, Kans.—Editor Motor Age—I have just read the article on brake adjustment in Motor Age, issue of November 24, and I would like some help on my model 25 Oakland 30. I have been running the car about 6 months and have had trouble with the service brake since the day I got it home. The brake is either too tight or of inquiring before he made his purchase whether he must pay labor charges if a defective part gives out. I believe a healthy threshing-out of the subject would too loose and no amount of adjustment is of any use, for it either would seize with the least pressure on the pedal and lock the wheel, sliding the tire on the ground, or it would not brake at all. I have ruined two sets of tires on no other account than by the brake locking the wheels and sliding the tires. I get along best by keeping the brake adjusted rather tightly and putting transmission grease on the brake band, but this necessitates pulling the wheel every time. Frequently it needs oiling when I am 40 or 50 miles from home, and the tires will be ruined before I get home, as it has happened once with me this summer. I thought of having new bands put on but these are surely not worn out, for they act just as they did when they were new, and if I did get new bands I would not know what to get.—George Stanton.

Your trouble most probably is due to rusty brake shafts on the rear axle. A grease cup provided for external bearing of the brake-rods or shafts that run parallel with the rear axle. If one neglects to turn up these cups occasionally, the brakes will not release as readily as they should and the brake lining will quickly become dried out by the heat of friction or probably burnt. When the friction material becomes dry the brakes will grab or take hold fiercely, and often lock the wheels. The first thing to do is to take off the wheels, apply kerosene to all bearings and working parts of the brake mechanisms and loosen them up so that they work freely; then oil them properly and adjust them. When adjusting the brakes, both rear wheels should be raised on jacks and the brake rods adjusted so that an equal retarding effort is placed on both wheels. All adjustments are made by lengthening or shortening the rods connecting the brake arms with the pedal or lever. After brakes are adjusted, test them on the road; if they still take hold too fiercely, remove the wheels, apply a little cylinder oil, replace the wheels and try them again. If still too fierce, apply a little more oil. Should too much oil be applied clean off with gasoline. In this way when the brakes are once properly adjusted and treated they will work satisfactorily for a

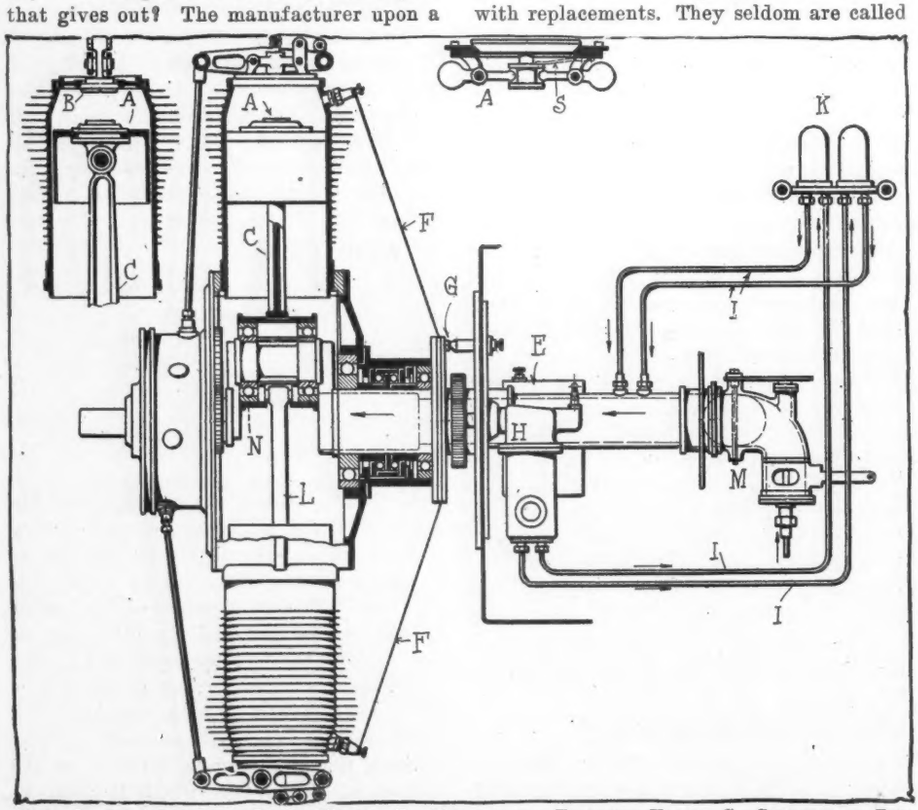


FIG. 3—A—AUTOMATIC INLET VALVE, B—MECHANICAL EXHAUST VALVE, C—CONNECTING ROD, WITH BEARING HEAD, E—MAGNETO, F—IGNITION CABLE, G—IGNITION DISTRIBUTOR, H—OIL PUMP, I—OIL PIPES, K—OIL DISTRIBUTOR, L—ROD PIVOTED IN BEARING HEAD, M—CARBURETER, N—CONNECTING ROD-BEARING HEAD

long time. Water and sand from bad roads may affect them temporarily but they will soon dry out and work satisfactorily again without special attention. If the brake linings have a glazed or hard crusty surface, they most probably have been burnt, in which case write the factory for new brake linings, giving the size and model of your car and the year in which it was made. This will help you.

FORD PRIMING CUPS

Elmhurst, Ill.—Editor Motor Age—For the benefit of fellow mortorists I wish to report a seasonable idea relative to starting a cold motor. My model T. Ford now being equipped with priming cups for each cylinder, I had a local plumber tap the inlet manifold on the top of the horizontal part. Into this opening I put a priming cup. When about to start my motor I open the needle valve one turn, flood the carbureter and allow about a teaspoonful of gasoline to run into the intake through the priming cup. After pouring gasoline through the priming cup, close it and crank the motor. Use the highest test gasoline. This is very important, for I find that in zero weather, after priming with this gasoline, I can start with one or two turns.—Harry F. Langhorst.

REDUCING 500-VOLT CURRENT

Vincennes, Ind.—Editor Motor Age—Will Motor Age kindly answer the following questions:

1. Will Motor Age give me the best system of wiring a battery recharging outfit where a 500-volt direct current is used, and twenty 32-candlepower lamps are used to reduce the voltage?

2. What voltage would storage battery receive from this outfit? I am enclosing herewith a sketch, Fig. 4, of a board we have installed, and wish Motor Age would give me its opinion on same.—John J. Yocum.

1. Your method is all right and the best, providing you do not have to pay for the current.

2. The battery as shown above will receive a charge at a 4-ampere rate. Its voltage will be the same as it would if charged on a 110-volt direct current circuit. Make sure that the positive side of the charging circuit is attached to the positive side of the battery. The above method of charging a 6-volt battery is very wasteful. If the current costs 10 cents per kilowatt, it would cost $4.00 to charge a 6-volt 60 ampere hour battery. If you happen to be using a 3 or 4-horsepower motor in the shop where this charging outfit has been arranged, it would be very much better to arrange to connect the batteries to be charged in series with it while the motor is running.

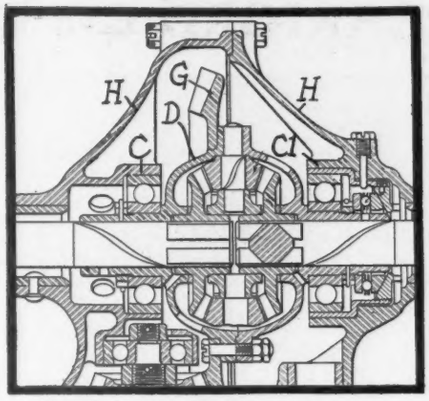


FIG. 5—LOCOMOBILE AXLE MECHANISM

SUPPORTING AXLE BEARINGS

Oxford, Ia.—Editor Motor Age—Will Motor Age through the Readers' Clearing House give a description and also a diagram showing the general method in use floating rear axle, that is, the bearings which carry the differential case and bevel gear?—Subscriber.

In Figs. 5 and 6 the methods of supporting the inside bearings of the full-floating rear-axles of four different makes of cars are illustrated. At I, Fig. 6, the rear-axle of the Alco shaft-drive car is shown with the cover C of the differential and bevel-driving-gear housing intact. At 2 of the same group of illustrations the same rear-axle is shown with almost the entire driving mechanism removed. To reassemble this axle one has but to replace the combined large bevel driving-gear and differential mechanism M so that the bearing BG rests in the support S, the bearing on the opposite side of the gear in the support SI, and the metal straps P put on to secure the unit into place; the transverse driving shafts TI and T then are slipped into place, the clutches CL fitted onto the outer ends of the shafts T and TI and in mesh with the outer edges of the wheel hubs; then all that remains to complete the assembly is to replace the hub caps and the cover C of the differential and driving-gear housing. The Stevens-Duryea rear-axle assembly shown at 3, and the Peerless construction at 4, are practically identical as far as the means of supporting the unit driving gear and differential mechanism is concerned, except that the cases of the latter are split horizontally instead of vertically and the covers are at the top of the case instead of at the rear side. The differential mechanism and driving gear unit M, shown at 3, was lifted out of the case K after the hub caps of the wheels had been removed, the ends A and AI of the driving shafts disengaged from the driving unit M, and the clamps or straps P taken off. At 4, the unit driving gear and differential mechanism M is shown in place, the cover of the case having been removed but the metal straps securing the bearings, fastened into place. Another method of support is illustrated in Fig. 5. The bearings rest in the cups C and CI, and the unit driving gear G and differential mechanism enclosed in the casing D, cannot be removed without first removing the rear-axle from the car and separating the halves H of the main housing. Through an error these illustrations were published in last week's issue without the reading matter attending.

LANSING-PORT HURON ROUTE

Lansing, Mich.—Editor Motor Age—Would you kindly give me, through the Readers' Clearing House, the best route from Lansing to Port Huron. I am not particular about scenery or large towns, so long as the roads are good. If not asking too much, would like to know the distance between intermediate towns en route.—Austin Jenison.

From Lansing travel by way of Dewitt, St. Johns, Shepardsville, Ovid, Owosso, Corunna, Flint, Lapeer, Attica, Imlay City and Port Huron. You will find fairly good roads on this route, and the distance from Flint to Port Huron is 74.2 miles.

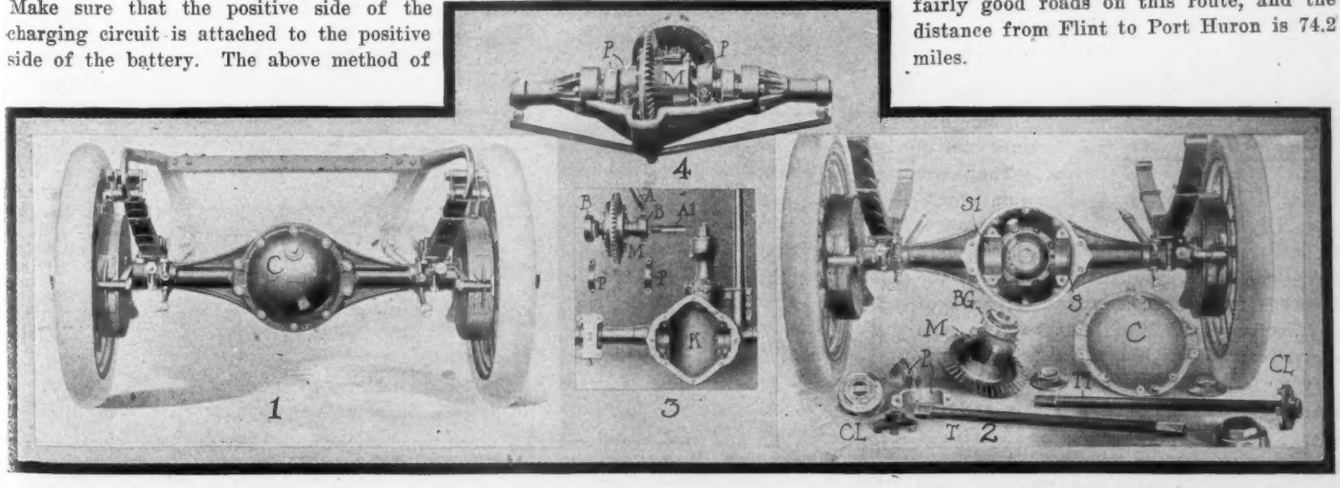


FIG. 6—ILLUSTRATION SHOWING MEANS OF SUPPORTING LARGE DRIVING GEAR AND DIFFERENTIAL MECHANISM OF FULL-FLOATING REAR AXLES

THE IMPROVED GARFORD G-8 CHASSIS FOR 1911

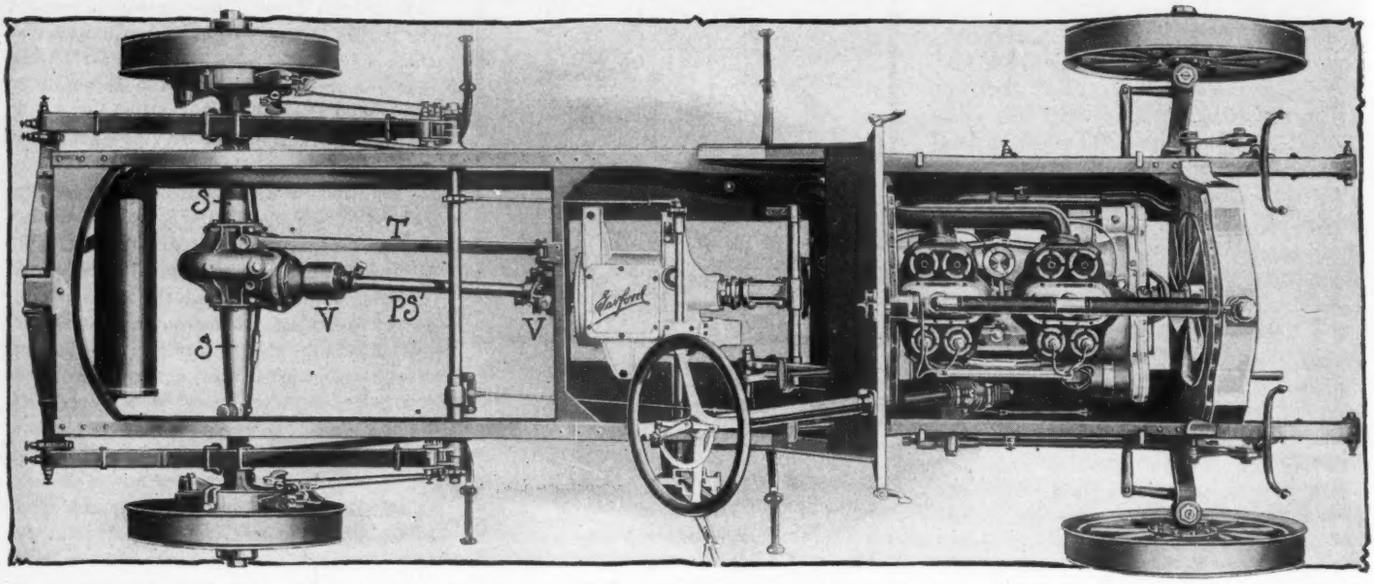


FIG. 1—CHASSIS OF GARFORD G-8 FOR 1911. THIS CHASSIS USES LOW-TENSION IGNITION IN WHICH THE MAGNETIC PLUG IS EMPLOYED. THE MOTOR AND FOUR-SPEED GEARSET ARE CARRIED ON TWO SUBFRAME MEMBERS

FOR next year the Garford Co., Elyria, O., will market its own Garford car. This machine having been marketed during the past couple of seasons by the Studebaker company and familiarly known as the Studebaker-Garford. In addition to its pleasure cars the Garford company has a line of friction-driven commercial trucks which are sold direct by the company. In the pleasure vehicle line the Garford model G-8, a seven-passenger touring car, is the leader and employs all of the Garford constructions. It is Garford product from start to finish, all parts of the motor, clutch, gearset, and rear axle being made in the company's factory, in which plant for years the chassis of the Cleveland, Rainier and Studebaker were made. Although the Garford company is new in the selling field and consequently to many buyers, it is nevertheless an old manufacturing concern, having built complete chassis for many years. The factory is completely fitted up with the most modern machinery for car manufacture, including gear-cutting machines, all the latest grinding machines, automatics, millers, planers, etc.

The Garford G-8 chassis is illustrated in Fig. 1. Its makeup includes a four-cylinder motor with cylinders 4¾-inch bore and 5¼-inch stroke. The cylinders are cast in pairs with opposite valves. They are mounted on a two-part aluminum crankcase, the upper half of which in a conventional manner supports the three plain bearings of the crankshaft as well as the bearings for both the camshafts; back of the motor comes the leather-faced cone clutch carried within the flywheel; midway of the front and rear axle is a four-speed gearset; and between this and the rear axle is a propellershaft PS with a universal joint V at the forward end and a similar one at its rear. The rear axle is a floating construction, the differential being carried in a malleable casting to which bolts the inner ends of the funnel-shaped seamless steel tubes S which make up the axle housing. The frame is a pressed steel one with submembers carrying the motor and gearset. The side members are hooked or arched above the rear axle.

The Garford Motor

The more complete details of the Garford motor appear in Figs. 2 and 5. Two or three details stand out prominently in this motor. One is the low-tension ignition system used, being the only one of its kind in the country. The magneto is a low-tension Bosch, which delivers a low-tension current to the four magnetic plugs P. These plugs are not the ordinary spark plugs but contain within them a coil winding with a soft iron core. When the low-tension current passes through the coil it forms a magnet of the core and this core becoming a magnet attracts a steel hammer which is rocked to it. The moment this is done the circuit is broken in the coil and the two points in the plug are separated, the spark following this separation. This is an out-and-out, low-tension system with a make-and-break spark, but with all of the make-and-break parts carried within the plug, which threads into the cylinder instead of these parts being bolted to the cylinders, as is the general custom in low-tension systems. With this ignition system the wiring is reduced to a minimum, consisting as it does of four leads carried within the copper tube T to the plugs, and a cut-out lead S to the dash, this cut-out being used to short circuit the magneto. There is with this system no external coil.

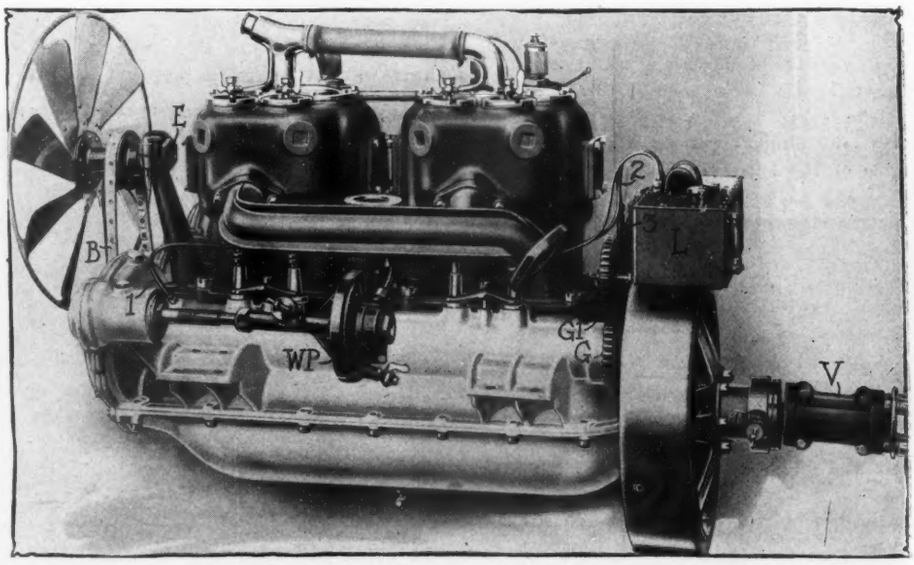


FIG. 2—EXHAUST SIDE OF GARFORD MOTOR SHOWING NEW V-BELT FOR FAN DRIVE AND MECHANICAL OILING SYSTEM

Some improvements have been made in the cooling system of the Garford motor over the present model, one being the use of V cross section belt B to drive the fan in place of the flat belt previously used. The tension of this belt can be varied by the use of eccentric bushing E. The tubular fan support is split at the upper end to take the eccentric bushing. By loosening the nut on the pinching bolt the bushing can be turned as desired and tightening the nut retains the adjustment. The centrifugal waterpump is located centrally on the left, the water entering the jackets beneath the exhaust valves, which is practically the hottest portion of the casting.

A mechanical system of lubrication is employed. Mounting the lubricator L above the flywheel permits a gear drive through the external gear G on the end of the camshaft and a corresponding gear G1 on the driveshaft of the lubricator. The oil flows through three leads, 1, 2 and 3, leading respectively to the three bearings of the crankshaft.

The carbureter made by the company, contains a venturi mixing tube in which is located the spraying nozzle. An auxiliary air valve is added and the regulation of it is through a small lever on the dash which regulates the spring tension.

The cone clutch fitted within the flywheel is illustrated in Fig. 4. It is a leather-faced member and carries depressions P, in which are inserted corks to ease engagement. In addition to the corks there is a series of clutch springs. Between the clutch and gearbox is a double universal joint V, Fig. 2. It is encased in a dust-proof housing. The gearbox is a tubular aluminum casting with removable end plates. The set gives four forward speeds with direct drive on the third, which drive is obtained by internal gear engagement. Both shafts are carried on annular ball bearings. Fifty carbon steel is used in the shafts and gears, both of which are manufactured in the Garford factory. The mainshaft, on which are the two sliding units, is formed with six integral keys. Attention has already been drawn to the rear axle construction. The Garford company was one of the earliest producers of the floating type of axle and has continued it ever since. The most striking detail of the axle is the stout housing made up of the funnel-shaped seamless steel tubes which bolt to the differential. Brazing is not resorted to in the details of this axle. The axle driveshafts between the differential and the wheels are nickel steel with integral clutches for transferring the drive to the road wheels. The pinion is carried between races of annular ball bearings with a thrust bearing at its front. The differential is also carried on annular ball bearings. Paralleling the propellershaft is a forged torque rod which is hinged for a right-and-left movement to the differential housing and has a vertical spring support at its forward end. The propulsion of the car is transmitted from the rear axle to the frame side members through radius rods, which rods are fitted with a ball-and-socket joint at each end. The front end of each rod is a ball carried on a short stubshaft, which shaft threads into the mainshaft and has lock nut to retain any adjustment that may be made.

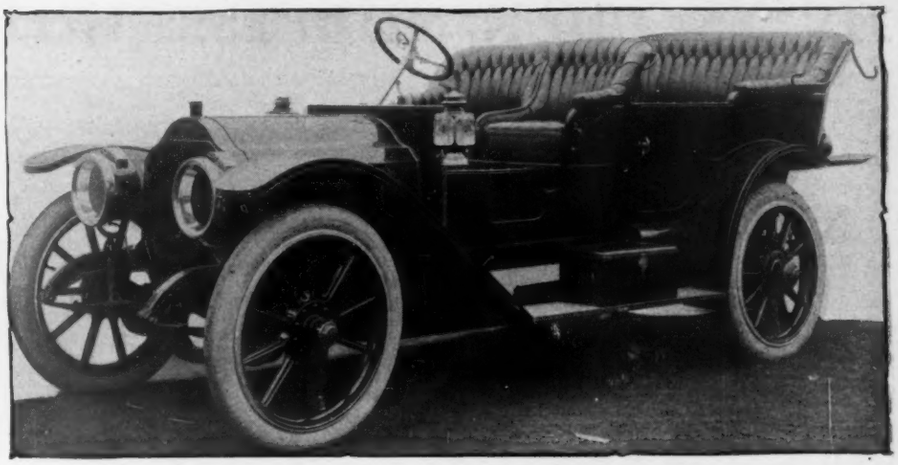


FIG. 3—GARFORD G-8, SEVEN-PASSENGER CAR

The steering mechanism is a worm and complete gear, the worm being keyed to the steering columnshaft and the gear formed integrally with its shaft. The gear is carried on two eccentric bushings, which furnish means for adjustment of the gear with the worm. The end of the gearshaft is squared to take the radius arm. On this model the tie rod between the steering knuckles is in rear of the axle. The front axle, an I-beam forging, is of the Mercedes type, the axle end being a vertical hub which fits within the jaws on the steering spindle.

Heretofore the Garford company has not entered into the body-building field, its sphere being that of chassis production only. For next year, however, it will build its own bodies, having erected a special building therefor. The company has purchased outright the Reading Metal Body Co., which it has brought men and machinery complete, and installed in a new fire-proof concrete building specially erected for the work. This building is a three-story structure, the main part 330 feet long and 50 feet wide. There is a wing 80 by 125 feet and one story in height.

FIG. 4—THE GARFORD USES A CONE CLUTCH WITH CORK INSERTS AND SPRINGS LOCATED UNDER THE LEATHER FACING

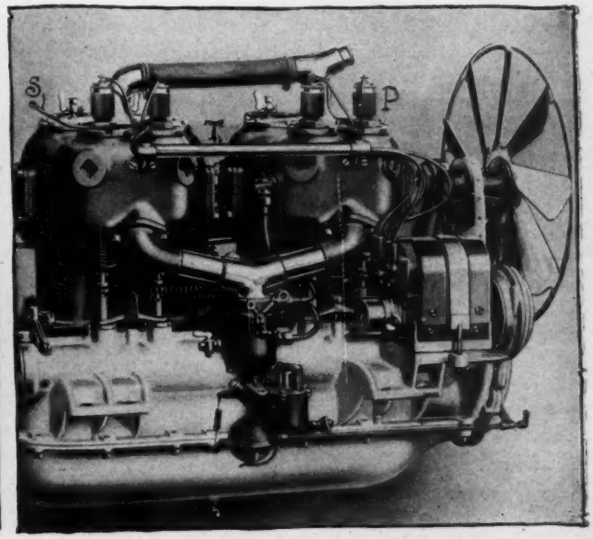


FIG. 5—A SPECIAL GARFORD CARBURETER IS USED WITH A DASH CONTROL OF THE AUXILIARY AIR VALVE

FIVE SELDEN MODELS, TWO CONTINUED FROM TH

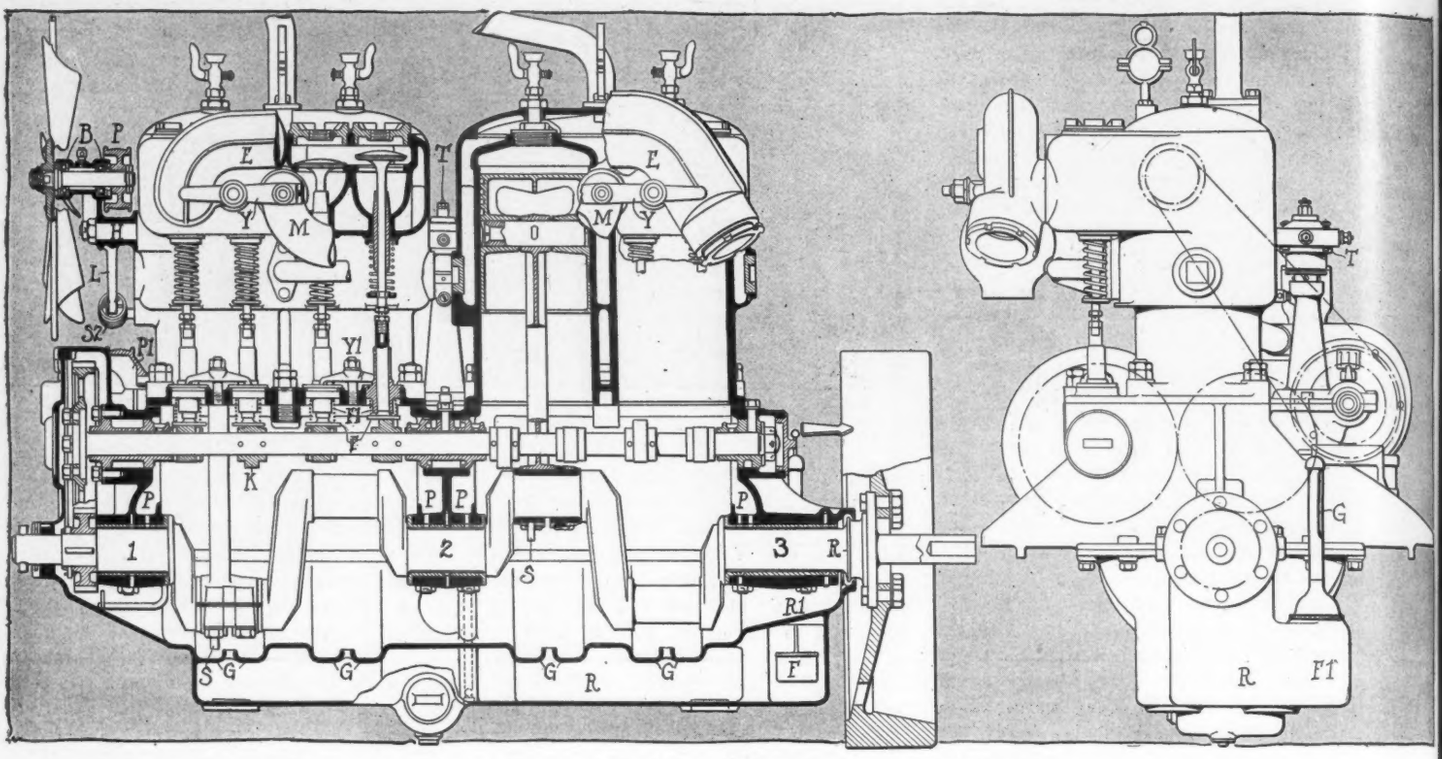


FIG. 1—SIDE AND END VERTICAL SECTIONS OF SELDEN 1911 MOTOR

THE Selden company for next year is listing five models. The five and seven-passenger touring cars that have been on the market this season will be continued and in addition three new models are added, all three of which are carried on the same chassis. There are several differences between the 1910 chassis and the 1911 type. On all the same motor is employed, which is illustrated in section in Figs. 1 and 2; the same cone clutch is employed on all; the same selective gearset is used, and the same rear axle is installed on all five chassis.

Coming to the differences, however, the most noticeable is that the 1911 chassis carries several frame improvements. The frame is longer to start with, because the wheelbase is 125 inches, as compared with 116 inches on the five-passenger car this year, and 122 inches on the seven-passenger car. But there are more frame changes: The side members are narrowed at the dash and they are raised above the rear axle. This year they have been straight from end to end. Then, in place of the semi-elliptic springs of this season, there are the three-quarter types used in the rear, these being 52 inches in length with leaves 2½ inches wide. The semi-elliptic front springs have not been changed and measure 38 inches long with leaves 2 inches wide.

As Fig. 1 shows, the timer T and the oil pump are located higher up between the cylinder castings, where they are more accessible, and the oil filler for replenishing the crankcase has been placed in a more convenient place. The oil gauge G also is arranged so that the indicator in the glass can be readily seen when adding fresh oil to the crankcase. This indicator is connected with the float F, which is carried within an extension F1 of the crankcase. Heretofore the well carrying this float was a separate casting, which bolted to the lower portion of the crankcase. The fan in the rear of the radiator is now driven by an endless belt passing over the pulleys P and P1, which belt may be replaced without dismounting the pumpshaft, an improvement over this year. The fanshaft is carried on two races B of ball bearings and the entire fan support is on the stud H, which enters the front cylinder casting. The fan bracket pivots on this stud and carries an arm L, to the end of which is attached the spring S2, this spring retaining a uniform tension on the fan belt. The mud apron has been improved and is detachable, being secured by spring fasteners. An important detail of change in the transmission between the gearbox and the rear axle is that a propellershaft with two universals is used on all models except the five-passenger touring car which uses one universal and has the propellershaft carried within a torque tube, this tube connecting rigidly with the differential housing and floating at its forward end on the propellershaft.

On both chassis a semi-floating type of rear axle is used. This axle carries two sets of brakes, internal and external, acting on drums 14 inches in diameter and 2 inches wide. The front axle is an I-beam forging; a combination worm-and-nut, rack-and-pinion steering gear is used.

It is in conjunction with the body types

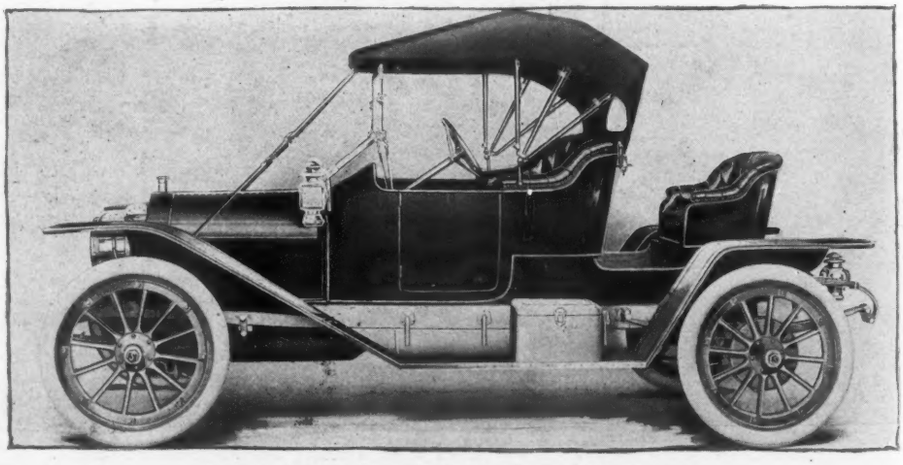


FIG. 2—SELDEN VARSITY ROADSTER ON 1911 CHASSIS

OM THIS SEASON AND THREE NEW 1911 BODY TYPES

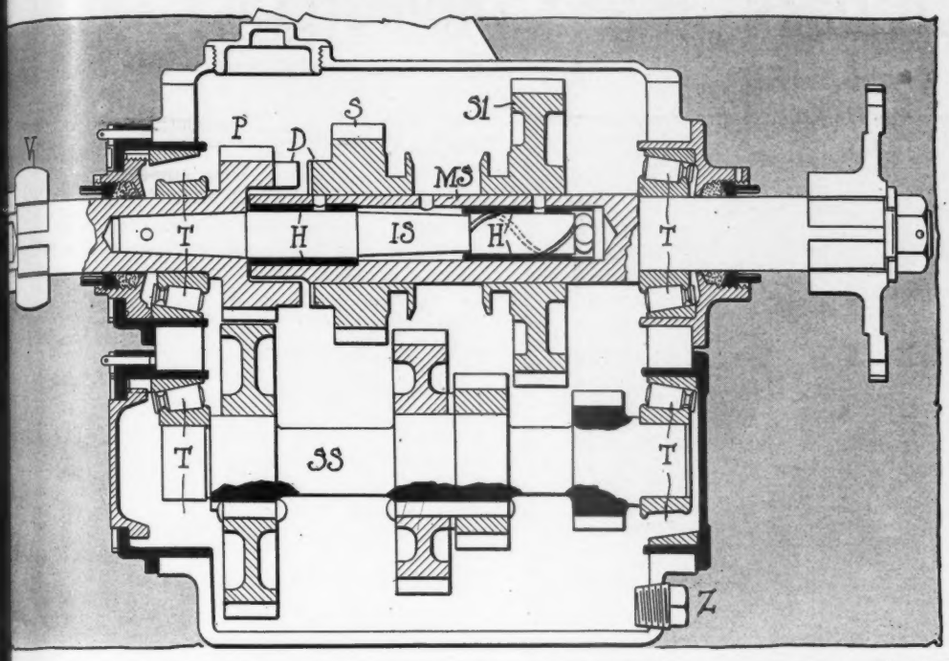


FIG. 3—THREE-SPEED SELDEN GEARSET. AN INTERESTING DETAIL OF DESIGN IS THE INTERMEDIATE SHAFT IS, WHICH IS ENTIRELY CONTAINED WITHIN THE MASTER PINION P AND THE MAINSHAFT MS. THIS INTERMEDIATE SHAFT FORMS A RIGID BEARING FOR THE FRONT END OF THE MAINSHAFT

that the difference between 1910 and 1911 Selden cars is seen. The two 1910 models carried over are known as 40-T, a five-passenger car with 116-inch wheelbase, and 40-S, a seven-passenger car with 122-inch wheelbase.

In contrast with these the three 1911 types are: 40-R, a two-passenger car with 125-inch wheelbase; 44, a four-passenger car with 125-inch wheelbase, and 46, a six-passenger car with 125-inch wheelbase.

All three 1911 models are fitted with fore-door bodies, two models being illustrated herewith, one model 40-R, a runabout, and the other model 46, the six-passenger car. Model 44, the four-passenger car, practically has the same lines as model 46, excepting that the body is shorter. All models are equipped with Firestone quick-detachable, demountable rims, and their equipment includes top, curtains, slip-cover, windshield and the usual lamp equipment, including a Prest-O-Lite tank.

Referring to the Selden motor in detail, it will be noted from Figs. 1 and 2 that it is a four-cylinder type employing L-shaped twin castings with the valves on the left side. The cylinders have 4¾-inch bore and 5-inch stroke, giving a formula rating of 36.1. By increasing the valve diameter as well as the size of the manifolds more power is obtained than during the present year. A change already referred to is that the timer T is not carried at the left rear, as this year, but is mounted on a pedestal between the two cylinder castings, as shown in Fig. 1, and is driven from the camshaft by a spiral gear. The lower end of the timer shaft drives the rotary oil pump which is used in the circulating system. The lubricating details are easily followed: There is the conventional reservoir R carrying the oil supply and the false bottom in the crankcase, having four sets of troughs G, which carry the supply for the splash. Each connecting rod carries a scoop S which dips into one of these troughs. The small size of the troughs greatly reduces the amount of oil which is in use at any one time. The lower ends of the connecting rods are offset and the scoop S is on that half of the connecting-rod cap which is directly in line with the rod itself. The splash created is collected in pockets P and led to the three main bearings 1, 2, 3, the latter having the oil ring R to prevent leakage and the return passage R1 through which the overflow finds its way back to the crankcase.

A detail in conjunction with the valve sytem is that the usual rollers are not employed on the lifter rods, flat mushroom type of feet F being used instead. These bear direct upon the cams K, which are pinned in position. Noise is guarded aginst by springs F1, which tend to hold the lifters in constant contact with the cams. The tops of the lifter rods carry nut and locknut for adjustment purposes. Each pair of lifter rod guides is secured in place by an X-yoke Y1 held by a central bolt. Both the intake manifold M and the exhaust manifold E are anchored to the castings by a single yoke Y for each cylinder casting. Carrying both manifolds high leaves the valve springs accessible in case of removal.

Ignition is by Bosch high-tension magneto. This constitutes a single system. In addition there is a supplementary system with current taken from a battery raised in voltage to a master vibrator coil and delivered to the plugs through the timer already referred to, which is connected in the primary circuit. This gives two ignition systems. A Stromberg carbureter is fitted. It is of the concentric float design without the usual waterjacket.

The details of the selective gearset are shown in Fig. 4. This is a vertical section of the set, the mainshaft MS being directly above the secondary shaft SS. Both shafts are carried on Timken roller bearings T. The master pinion P is integral with its shaft and on the forward end of which is a universal coupling V for union with the clutch shaft. The pinion is recessed to take an intermediate shaft IS, and the mainshaft MS is also recessed to receive this intermediate shaft. Between the intermediate and the mainshaft are bushings H as well as drilled openings for lubrication. Both sliding units S and S1 are carried on the mainshaft. As illustrated, direct drive is by interlocking the gears P and S, obtained by meshing the corresponding clutch teeth D on the opposing faces of these gears. The use of a plug Z affords easy facilities for draining the lubricant from the case.

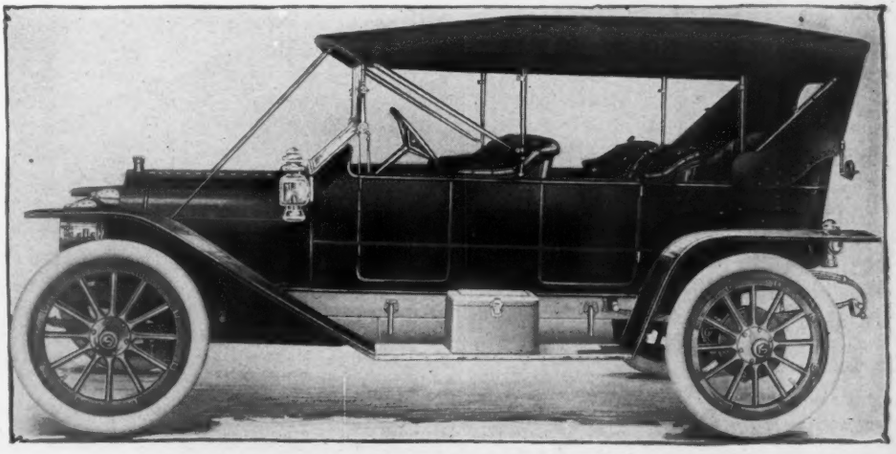


FIG. 4—SELDEN SEVEN-PASSENGER CAR ON 1911 CHASSIS

The Realm of the Commercial Car

NEW TYPE OF GAGGENAU BUS BROUGHT OUT FOR USE IN SARDINIA

BOSTON STUDIES MOTOR TRAFFIC

THE Boston chamber of commerce took up the problem of traffic congestion Friday and merchants and motor car dealers and truckmen were given a chance to air their views. The commercial vehicle dealers had two propositions that seemed reasonable and something may yet result from them. One of these was to the effect that the stret cars should be shifted from Atlantic avenue and the space they occupy under the elevated railroad be made into a motor truckway with smooth pavements from which all horse-drawn vehicles should be barred. It was felt that this would help the traffic much, because the avenue is a direct line of communication between the big railroad terminals at South Boston and the ones at Charlestown. The other was to reserve a portion of Charles street in much the same way. It was pointed out that if the street railways may have reservations the motor trucks should have them, too. The matter will be brought to the attention of the legislature this winter and a bill will be presented asking that the city officials of Boston be given power to do something along those lines.

BAN LIFTED ON TRUCKS

Manufacturers, dealers and users of motor trucks will be interested in the announcement that insurance companies have withdrawn the restrictions whereby gasoline trucks were denied admittance to steamship piers in New York city. Some time ago the insurance companies established a rule requiring occupants of piers, railroads and steamship companies to sign a warranty to the effect that such trucks would not be admitted to their piers, and unless such warranty was signed an extra premium of 50 per cent would be charged. As a result of this dealers have found that a great many merchants have refused to supplant their horse-drawn delivery systems by motor trucks, owing to the necessity of whatever trucks they use frequently visiting the docks and piers to deliver or receive freight. The railroad and steamship lines have pointed to the attitude of the insurance companies as their reason for refusing admittance to the trucks.

Truck manufacturers, members of the National Association of Automobile Manufacturers, brought this condition to the attention of the association, which at once took the matter up with the insurance companies with a view of demonstrating that such restrictions were unnecessary, and although concessions were made by the latter in the amount of extra premium charged, the occupants of the piers were for the most part firm in their refusal to pay any excess premium, and have continued to sign the warranties that they would not admit the trucks.

The negotiations with the insurance companies have been conducted by the general traffic department of the National Association of Automobile Manufacturers, and J. S. Marvin, general traffic manager of the association, has just announced their successful conclusion.

TRUCK SITUATION IN BOSTON

Another chapter in the commercial situation in Boston was written last week, when the two organizations held meetings. After the Commercial Motor Vehicle Association held its session a story gained credence that there was going to be a separate show for commercial trucks next spring. This proved to be based upon rumor more than fact. What really happened was that the association took a vote to see how much space would be taken in case a show was run and the figures showed more than 40,000 square feet. There were proposals from various sources offering assistance to run the show and some of the radicals were in favor of it. But the wiser heads prevailed because the organization had gone on record at a previous meeting that it would in no way antagonize the regular show or the Boston Auto-

NATIONAL USED TO DEMONSTRATE THE HOWE FIRE APPARATUS

mobile Dealers' Association. To have promoted a separate show would have been doing so naturally. Much of the work was placed in the hands of committees, and it was decided to have a conference with the other organization.

When the Boston Motor Truck Association met Friday it had before it a proposition for a conference with the Commercial Motor Vehicle Association. It was decided to accept and a committee was appointed for a conference. The Boston Motor Truck Association also sent an offer of co-operation to the Motor Truck Club of New York, saying it would be glad to aid it in any way in promoting the run of commercial vehicles from New York to Boston and return in connection with the New York commercial show. Finally the officers and directors of the organization tendered their resignations, so there would be no bar in the way of an amalgamation if the conference committee could bring it about. So it looks brighter for the situation in Boston.

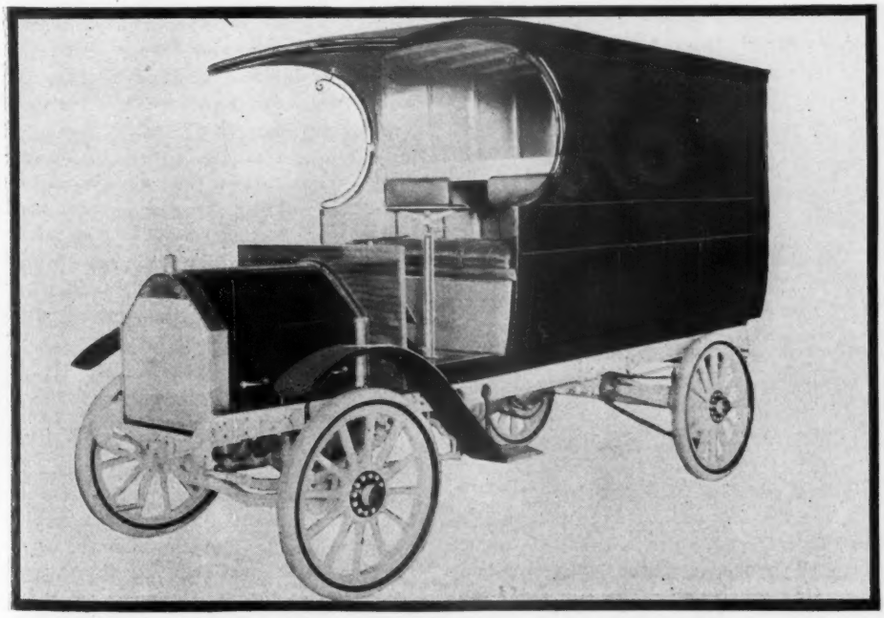
RAPID 3-TON TRUCK IN USE IN MISHAWAKA, IND.

EWING MOTOR DELIVERY

The Findlay Motor Co., Findlay, O., is marketing and manufacturing the Ewing motor delivery wagon, built with a carrying capacity of 1,000 pounds and having 50 per cent overload as its maximum capacity. The general design is that characteristic of the majority of four-cylinder delivery wagons, namely, with the four-cylinder motor located under the forward bonnet. From the motor the power is transmitted through a multiple-disk clutch to a three-speed sliding gearset and thence to a jack-shaft and by side chains to the rear wheels.

The motor, a four-cycle vertical type, has a nominal rating of 35 horsepower with magneto ignition. It is water-cooled with circulation maintained by a centrifugal pump. The flywheel is made in the form of a fan, and so the usual fan in the rear of the radiator is eliminated. New Departure double-row type of ball bearings are used for the axles and gearset.

The truck running gear is built around a pressed steel frame construction, which is supported in front on a set of semi-elliptic springs and carried on the rear of the same type. In spite of the wheelbase measuring but 106 inches the carrying space is large. On the platform type the load space is 80 inches long and 48 inches wide. In the closed body type the space measures 77 inches long, 46 inches wide and 58 inches high. In spite of this carrying capacity the truck has a turning circle of 27 feet, which is sufficiently small to eliminate reversing when turning in ordinary streets. Road wheels carry 32 by 3½-inch solid tires. Two sets of brakes are fitted, both acting direct on rear wheel drums. The car is fitted with left-hand control centered above a vertical steering column and carrying a worm-and-sector reversible steering gear. The emergency brake lever and also the chain-speed lever are located in the center of the footboard for right-hand control. The car is designed to operate at 18 miles per hour, at which speed the motor is revolving 1,200 revolutions per minute when it is doing its best work.



EWING MOTOR DELIVERY WAGON MADE BY FINDLAY MOTOR CO.

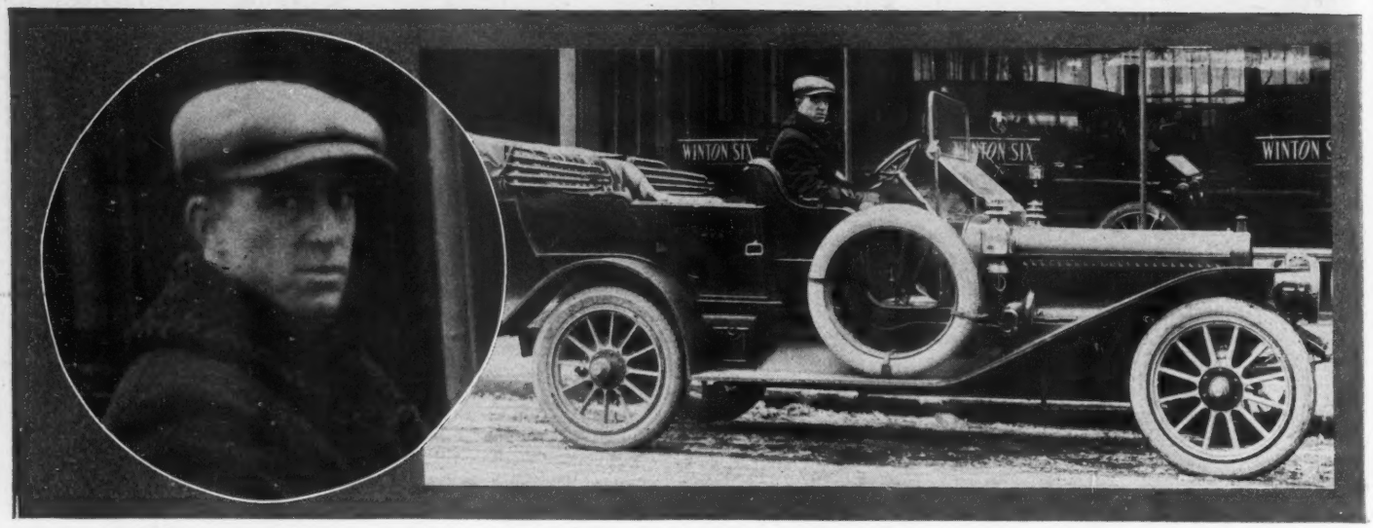
PATERSON TRIES OUT ENGINE

The possibilities of the motor-car fire engine were demonstrated in the presence of Mayor McBride, Fire and Police Commissioners Ryan, Hopson and Mallon, Board of Works Commissioner Milson, Chief John Stagg and several other interested officials at East Twenty-fourth street and Eighteenth avenue, in Paterson, N. J., recently. For 4 hours the motor-driven pumps forced 413 gallons of water each minute through the 1¼-inch smooth-bore nozzle of the deluge set and hurled the water 223 feet from the nozzle. The hydrant pressure in the test was 31 pounds. The principal differences in the Howe apparatus and other motor fire engines are the pumps. Mr. Howe invented a piston pump which works well by motor-drive. The chain-drive is used on the battery of six-piston pumps, which are 7 inches in diameter. The stroke is 3 inches. The engine used in the trials at Paterson is located on a National chassis.

USING CATERPILLAR ENGINE

Charles Hoskins, who recently made some large purchases of land at Connell, Wash., has just received a large caterpillar engine, which he will use in his farm work. The engine will do the work formerly done by forty horses. It will draw ten 14-inch plows, with a harrow and a packer behind it. The engine has attracted great attention on the coast.

From the Four Winds



A. C. LEONARD, OF MINNEAPOLIS, WINNER OF THE WINTON COMPANY'S 1910 UPKEEP CONTEST

NEW ORLEANS' Mardi Gras Meet—Entry blanks are out for the New Orleans Mardi Gras speed carnival, the third running of which will take place February 25, 26 and 27, 1911. A list of events has been arranged by Manager Homer C. George, of the New Orleans Automobile Club. The prize list amounts to $3,500, with the various events ranging from 5 to 50 miles each in addition to two 1-hour races.

Woman's Record Mileage—"Doing ordinary shopping and enjoying little pleasure runs" is the description given by Miss Irene E. McKnight, of Omaha, Neb., of her method of covering over 20,000 miles in a motor car since the first day of April, 1910. Miss McKnight, whose family resides at 116 North Fortieth street, Omaha, spends most of her time in her four-cylinder, 18-horsepower Franklin touring car. This 20,000 miles in about 200 days is about the highest mileage for so short a time for any woman who tours simply for the pleasure of driving, it is claimed by the Franklin company.

Would Amend Law—Maryland state officials are not quite satisfied with certain sections of the new motor vehicle law and are talking of having important amendments made to it. Chief among these is to make the registration year of licensed machines run from May 1 to April 31, instead of from January 1 to December 31, as at present. Under the latter plan Motor Vehicle Commissioner John E. George claims the state loses thousands of dollars yearly because many owners keep their cars in garages unused for the winter and apply in April or May for part-year licenses, obtaining a deduction in fee for each month of the elapsed time between January 1 and the time the license is applied for. Another amendment will be to force a new registration of chauffeurs each year. This, it is claimed, would bring in additional revenue of about $20,000 each year at $5 per driver. Under the present law a driver registers the first year, paying a fee of $5. This registration remains good for all time.

Racing at Tucson—The Tucson Automobile Club, of Tucson, Ariz., recently organized, announces that it will hold a meet on its new speedway January 2, under the sanction of the A. A. A. This new speedway is a 14-mile circuit, and it is expected that ten or a dozen cars will take part in the competition. The club also will promote a road race from Phoenix to Tucson, which will be a curtain-raiser for the speedway events.

Boys Not Punished—Most of the cases of the thirteen boys arrested in Indianapolis for "borrowing" motor cars in the streets for joy rides have been settled by the boys pleading guilty to the theft of the gasoline in the machines and being allowed to go under suspended sentence. No effort has been made to convict them of the theft of the cars, because to prove larceny in Indiana it must be shown there was an intention to deprive the owner permanently of the property.

Hup Crew Off to Honolulu—After having covered close to 4,000 miles of United States soil, and having completed the first and worst lap of its 40,000-mile journey, the Hupmobile world-touring car and its crew sailed from San Francisco December 13 for Honolulu. The sea voyage is the first rest had by the car and Drake, Hanlon and Jones since the start was made from Detroit, November 4. Thirty-five days later the car pulled triumphantly into Los Angeles, at the head of a long-escorting procession. The Hupmobile has a greater mileage of rough American roads to its credit than is usually the case in a transcontinental tour, for the reason that several long detours were made to include important points. Even so, the journey is no more than one-tenth completed, for the route it will take before it rolls into Detroit from the east will mean traveling some 40,000 miles and will include visits to practically every civilized country in the world.

Columbus Officers Chosen—Norman O. Asby, formerly secretary of the Columbus Automobile Club of Columbus, Ohio, was elected to the presidency of that organization at the recent annual election. He was opposed by Charles E. Firestone, who was president during the past year. The rivalry between the two was of the most friendly nature. Charles C. Jaynes was elected first vice-president; Robert F. Bode, second vice-president; Herbert Mason, treasurer, and Nelson J. Ruggles, Ira P. Madden and M. J. Hanly, members of the board of governors.

New Adirondack Roads—It is considered remarkable that Franklin county, N. Y., which shows only a total assessed valuation of $1,500,000, should issue bonds to the extent of 500,000 for a system of improved county highways. The plan involves 152 miles of road, which is to cost $3,000 per mile, and the contract calls for this work to be done inside of 2 years. The first section to receive attention will be that through the most beautiful part of the Adirondacks, and Saranac lake to Malone by way of Paul Smith's, Meecham lake and Chasm falls to connect with the state road from Malone to the Canadian line. The Canadian government is planning to build a fine macadam boulevard from the line junction to Montreal, along the banks of the St. Lawrence river. The work will be commenced early in the

spring on the road from Malone to Saranac lake, and most of it will be completed for the touring season of 1911. The Malone board of trade and Malone Automobile Club are largely responsible for this proposition.

Oregon Interested—The Oregon Good Roads State Association held a remarkable representative meeting at Portland on Monday, December 12. More than 200 road supervisors responded to the invitation of the meeting and eight or ten judges from the leading counties. Five laws were taken up, section by section, and argued thoroughly, but without any noticeable friction in the debate. The main feature of the meeting was the appointment of a board of highway commissioners and a state highway board to carry on the work.

Winter Motorist Registers—During the summer time there are plenty of tourists registering at the office of the Automobile Club of Syracuse in the Onondaga, but it is rare to receive them after winter genuinely sets in in this section. Yet Alfred Young, of the Mercer Automobile Co. of Trenton, N. J., braved Arctic conditions, and with a man from the factory formed the only touring party passing through Syracuse in a fortnight. The car ploughed through miles of mud and sleet all the way from Trenton to Syracuse, via Scranton and Binghamton. From Syracuse Young went to Rochester, Buffalo and Ohio points.

Regal Visits Atlanta Again—For the second time in the all-southern tour, the Regal Motor Car Co.'s endurance car, the Regal Plugger, has made a visit to Atlanta. The first stop was on the occasion of its western trip across Dixieland. The route from Atlanta angled to the north through northern Georgia, Tennessee and Arkansas, touching the borderland of Texas and Texarkana. The return trip was through Louisiana, Mississippi and Alabama and northern Florida, Norfolk, Va., being the final destination and place of departure. The arrival of the Plugger in Atlanta completed two-thirds of this trip through the south. At this point, the Plugger's odometer recorded 31,775 miles.

Touring Hardships—Some of the difficulties that have been experienced by the good roads tourists who are making the three-coast tour from New York to San Francisco in the interest of good roads may be imagined from the accompanying illustration which shows the Ohio car crossing Bear creek in northern Alabama. This is only one of many such situations that have been encountered by good roads tourists, and shows the crying needs which exist in southern territory for better road conditions. On a mountain road near Anniston, Ala., the Ohio pathfinders passed over one of the most dangerous of the mountain roads which they have encountered. This road is too narrow for two vehicles to pass, and over its side is a sheer drop of 300 feet into a ravine into which any motorist is extremely liable to drop after a severe rain. Practically no improvement has been made in this road since it was opened by pioneer settlers 50 years ago.

Boston's Service Car—For the service and accommodation of official visitors to Boston, all Boston organizations, societies and clubs, the Boston service car has been inaugurated by the New England branch of the Velie Motor Vehicle Co. The car will be placed at the disposal of Mayor Fitzgerald, Governor Draper and the Boston Chamber of Commerce, and will be the official car for the entertainment of visitors from all parts of the country.

Important Point Decided—Dr. T. L. Harrington, of Milwaukee, Wis., has won his contention against the Milwaukee Electric Railway and Light Co. in an action before the railway commission of Wisconsin in reference to charges for current consumption in charging his electric motor car. Dr. Harrington was compelled to pay a minimum charge of $5 per month, while persons who use electricity for home lighting were asked to pay only $1 minimum per month. The action resulted in a change in rates covering nearly every consumer in Milwaukee.

Bay State A. A. Reorganized—The reorganization committee which has been handling the affairs of the Bay State A. A. for the past year has put the club into such good shape that it has decided that its work is done and the club will be turned over to its members shortly. On December 28 there will be a meeting at the club rooms at which a date will be selected for an election of officers and de the matter of the yearly dues will be cided upon. The club is now in prosperous circumstances due to the energetic work of the committee comprising L. R. Speare, J. H. MacAlman, J. W. Maguire, Harry W. Knights, Chester I. Campbell, A. B. Henley, Josiah S. Hathaway and Ernest A. Gilmore. It is probable that these men will be chosen officers.

Hope Legislature Will Help—There are indications that an effort will be made at the next session of the Kentucky state legislature to secure an amendment to the present law regulating motor cars which was passed at the session last winter. In the current number the official organ of the Louisville Automobile Club makes the following editorial comment: "The Kentucky legislature meets in 1912, and it is the purpose of the club to see what can be done before that body in the way of securing improvement in the present state motor law. There are several objectionable features to the law which should be changed, and if the motorists of Kentucky pull together it is likely the changes will be made."

Texas the Ohio's Goal—Texas is now the goal of the Ohio pathfinding car, en route from New York to San Francisco to blaze a new route from coast to coast by way of the southern states. The party, which is composed of E. L. Ferguson, the American Automobile Association representative, who is spreading the gospel of good roads for his organization; G. W. Finney, representing the Ohio Motor Car Co., Charles Thacher and Fred D. Clark, has left Helena for Dallas, Fort Worth and El Paso. By fast driving across Texas and through the desert country, the motorists expect to reach the Golden Gate in time to deliver Mayor William F. Gaynor's good roads message to Mayor McCarthy on Christmas day. Despite the roads, the car is traveling fast.

TRANSCONTINENTAL OHIO CROSSING BEAR CREEK IN NORTHERN ALABAMA

RAYFIELD CARBURETER—ITS CONSTRUCTION

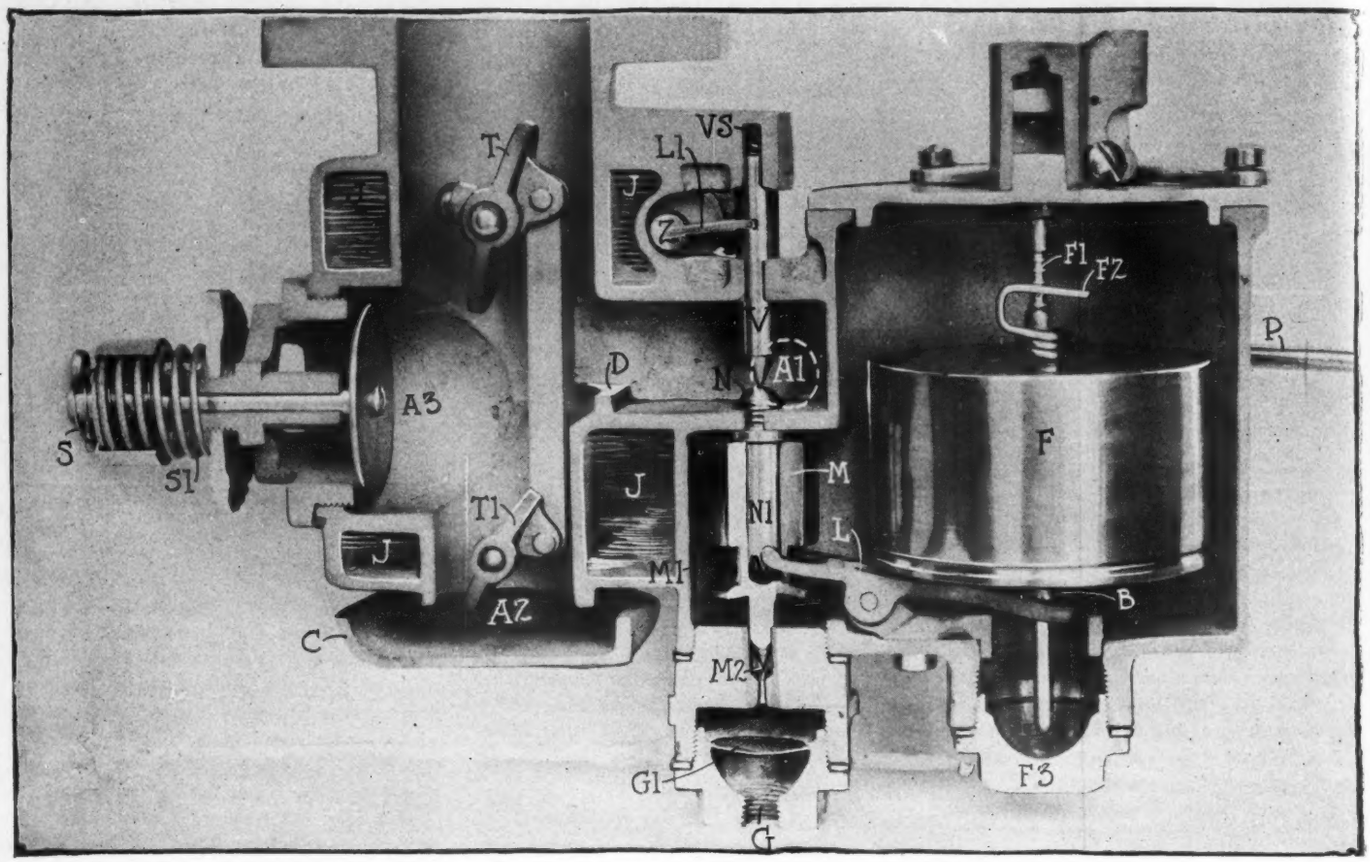


FIG. 1—SECTION ILLUSTRATION OF RAYFIELD CARBURETER—A1, FIXED AIR ENTRANCE; A2, AIR ENTRANCE CONTROLLED BY VALVE T1; A3, AUXILIARY AIR ENTRANCE; V, NEEDLE VALVE INTERCONNECTED WITH THROTTLE T; J, WATERJACKET SPACES; F, SPUN METAL FLOAT

TO obtain the proper proportion of air and gasoline vapor for all motor speeds and with varied motor designs, has led to a fertility of carbureter design that has during the past 6 months attracted more than ordinary attention. A new design to come before the people during that period is the Rayfield, illustrated on these pages, which is a design of Charles Rayfield, for years engineer of the Tincher company. The Rayfield carbureter is owned and manufactured by Fiendeisen & Kropf Mfg. Co., Chicago, Ill., a concern which for several years has been a large factor in the manufacture of brass castings and brass fixtures for motor cars. The Rayfield carbureter aims at solving the great problem of carburation, namely, the maintenance of a desired ratio between air and gasoline, by interconnecting the needle valve in the spraying nozzle with the throttle, as well as interconnecting the throttle with one of the air valves.

Fig. 1 shows the general details of construction. The air system includes three air entrances, a fixed circular opening A1 with the nozzle at its inner end and which is indicated by the dotted circle; a second air opening A2 controlled by the butterfly valve T1, which valve is opened and closed in fixed relation with the throttle T; and an auxiliary air valve A3 which is closed through the tension of two springs S and S1, the former compressing first and the latter S1 compressing only after the first has become entirely compressed. The air passage is a cross, the vertical tube with the valve T1 at the bottom and throttle T at top being one arm; and the horizontal passage made up of the auxiliary air valve passage and the passage containing the nozzle making the horizontal part.

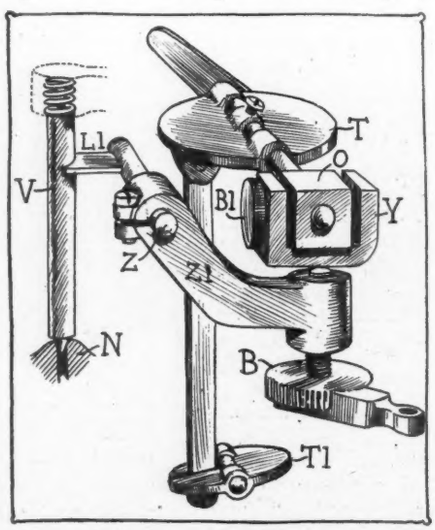


FIG. 2—PERSPECTIVE SHOWING HOW THE THROTTLE T IN THE RAYFIELD IS INTERCONNECTED WITH THE NEEDLE VALVE V, AND HOW BY THE ADJUSTABLE CAM Y THE AMOUNT OF LIFT GIVEN THE VALVE V CAN BE VARIED IN PROPORTION TO THE THROTTLE OPENING

There is no venturi-tube construction and the air entering by way of the fixed opening A1 makes two right-angle turns before passing the throttle. The air valve T1 is connected with the throttle so that it opens slightly in advance of it, and the auxiliary air valve A3 is so adjusted as not to open until the valve T1 has been opened to a considerable extent.

The gasoline system of the carbureter is a simple one and arranges itself around the gasoline valve M with its point M2 of German silver which controls the flow from the tank through the connection G and the screen G1. This gasoline valve is under control of the spun brass float F through the mediary of a pivoted lever L. There is a yoke on each end of this lever, that on one end spanning the valve M, the other end bearing upon a ball expansion B on the stem of the float. The nozzle N threads into the carbureter casting and extends downwards as a sleeve N1 inside of the gasoline valve so that the gasoline passing the point M2 enters by way of a series of openings M1 into the valve, and thence up through the sleeve N1 standing $\frac{1}{16}$-inch below the opening at the point N. Into this opening rests the sharp pencil point of the needle valve V, which valve is raised every time the throttle T is opened and lowered every time the throttle is closed, so as to maintain a fixed proportion between the gasoline and

air supply demanded by the carbureter.

The method of interconnection between the valve V and the throttle T is shown in dotted lines in Fig. 2. The short lever L1 is attached to the pivot Z and has its end entered in a slot in the stem of the valve V. An arm Z1 attaches to the stem Z, this arm carrying a set screw B. The upper end of this set screw bears upon a cam Y which is on the throttle axis. TK is the throttle lever which has a connection with the control on the steering wheel. This is seen in Fig. 4.

It will be seen that as the handle TK is drawn in to the right side the cam Y will bear against the point of the adjusting screw B, forcing it downwards, and as the lever Z1 is carried down by the opening of the throttle the needle valve V is carried up. For low-speed gasoline adjustment the adjusting screw B can be raised or lowered to give the desired lift of the valve V. There is, however, a much finer adjustment of this valve through the cam Y, and which system of adjustment is illustrated to advantage in Fig. 2. It will be seen that the throttle axis carries a block O and that through this block the adjusting screw B1 passes, so that by means of this adjusting screw the cam Y can be carried to the right or the left. It will be seen that by carrying it to the left, the curved face which bears upon the screw B does not act on the screw as much as if the cam were carried to the right. Carrying it to the right produces a pronounced downward movement of the lever Z1 with the first opening of the throttle, whereas carrying it to the left produces scarcely any downward movement of the first opening of the throttle and only a slight downward movement as the throttle is opened nearly to the full. There is thus by this cam regulation a wide field of adjustment and through which the proportion of lift of the valve V to the opening of the throttle can be varied, one adjustment giving more gasoline when the throttle begins opening, and the other more when it is nearly brought to the full opening. As Fig. 1 shows, there is a small spring VS above the valve which forces it down as soon as the throttle control is removed.

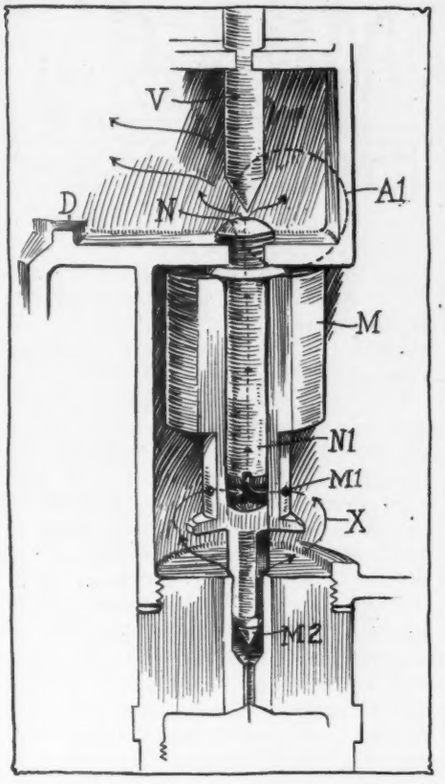


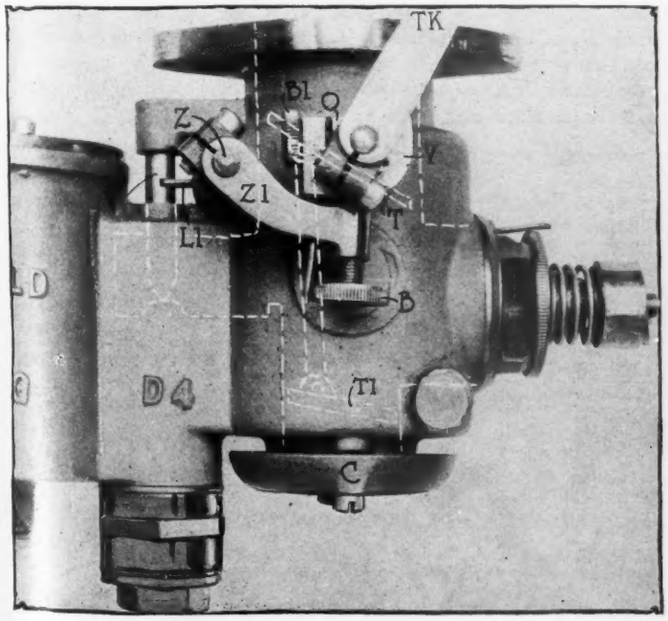
FIG. 3—THE RAYFIELD GASOLINE CONTROL NEEDLE VALVE: THE VALVE M HAS A GERMAN SILVER POINT, M2, AND A SERIES OF HOLES, M1, THROUGH WHICH THE GASOLINE ENTERS INSIDE THE VALVE, AFTER WHICH IT RISES THROUGH THE HOLLOW PART, N1, OF THE NOZZLE, N

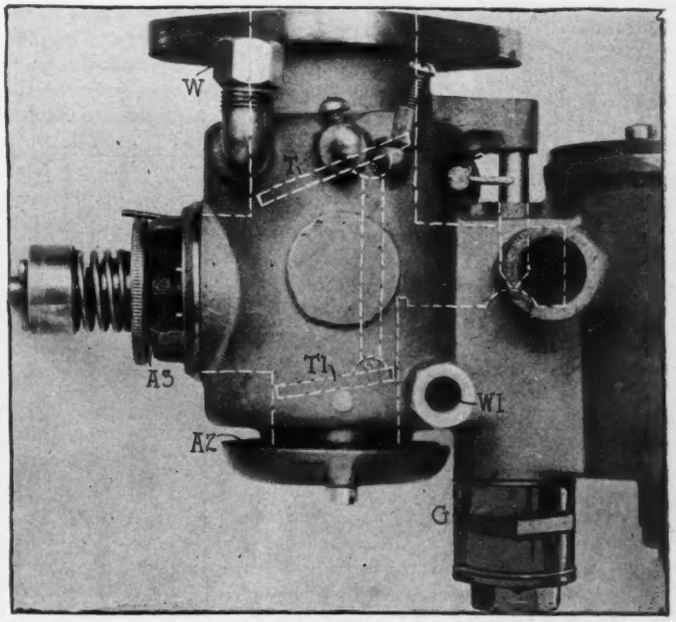
A further detail of the gasoline system in this carbureter is the means whereby the float F can be raised or lowered. The float carries attached to its upper surface a coil spring F2, the end of which rests in one of a series of circular grooves F1 in the float stem. By simply forcing the float up or down to the required height, so that the spring rests in the desired groove, any float level can be obtained. There is also in the bottom of the float chamber a drainage cup F3, which threads into place and forms a receptacle for water and other heavier-than-gasoline deposits.

In this carbureter a further gasoline detail is the priming arrangement P which works towards easier starting. The nozzle N is located in a chamber with a horizontal floor and at one side is a shoulder D which forms a chamber to collect the overflow of gasoline from the nozzle. This gives a puddle formation over which the in-rushing air must pass, thus giving the required rich mixture for starting. The flooding is accomplished through a connection P from in front of the radiator. There also is a further gasoline feature in the form of an overflow cup C which collects all gasoline condensation from the main mixing chamber. This gasoline is licked up by the air with the first opening of the air valve T1.

The waterjacketing system is a standard one and, as shown in Fig. 4, the casting is tapped at the points W and W1 for the intake and exit water passages. There are the spacious jacket openings J entirely enclosing the central mixing chamber as high up as the throttle.

From a structural viewpoint the Rayfield carbureter is a good job. The red brass casting is made in the company's own foundry and is a model of its kind.





FIGS. 4 AND 5—THE RAYFIELD CARBURETER: A1, THE FIXED AIR OPENING, THE AIR PASSING THROUGH IT STRIKING UPON THE SPRAYING NOZZLE; W AND W1 ARE THE WATER CONNECTIONS FOR THE WATER-JACKETING SYSTEM; B AND B1 ARE THE NEEDLE VALVE ADJUSTING SCREWS

The Motor Car Repair Shop

Hints for the Amateur

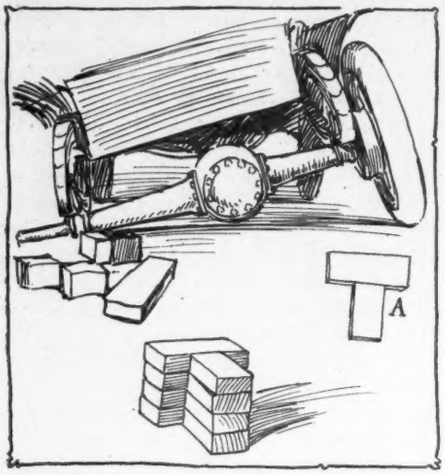


FIG. 1—BAD AND GOOD BLOCKS

THERE are but few foremen of motor car repair shops that have not seen accidents similar to that which is depicted in the upper portion of Fig. 1, a motor car that had been jacked up and the axle rested upon a number of small, insecure blocks so improperly arranged that after the wheel was removed, for some unexplained cause they collapsed, allowing the protruding ends of the axleshaft and perhaps the lower end of the brake pivot support to be either badly bent or broken.

Generally, with one wheel resting on the floor an axle can be jacked up and blocked with comparative safety, provided the blocks are not almost round or in otherwise bad shape from long usage, or, that the surface on which the wheels rests is not wet or greasy enough to be slippery. The corners or edges of blocks found in the repair shop often are worn away so that only half the original flat surface remains; and blocks that have been used between the shaft and hammer in driving tight-fitting gear-wheels and the like into place, or in driving road wheels off or onto their shafts, are usually damaged to such an extent that they are positively unfit for use in blocking up a car.

If, as in the case illustrated, the wheel which remained intact happened to rest on a greasy floor, a slight unintentional jar would be sufficient to cause the accident represented; and if the remaining wheel happened to be resting on the wet and slanting portion of a wash rack, the same might happen without even the jar to start it. The junior repairman and unexperienced motorist usually are the perpetrators of this sort of mishap. It is not uncommon to see them simply jack up one end of an axle and remove the wheel with nothing under the axle but an unsteady jack. Often the jaw of the jack is placed directly under the slanting trussrod of the rear-axle so that it will give way at the slightest provocation when that end is jacked up; and there are many, who, though they have sense enough to find a more suitable place than the truss rod, often grip the axle tubing or a nut or protruding end of a spring clip with one edge or lip of the jack jaw so that the same disastrous results are obtained.

To avoid misfortunes of this character, most shops are equipped with an ample number of specially constructed wooden stands, whose design and use already have been shown in these columns. It is an unwritten law that no wheel ever should be removed from an axle unless that end of the axle rests upon one of these stands, and not on a jack. These stands simply consist of a block of wood 2 by 4 inches or 4 inches square and from 12 to 18 inches high, mounted endwise on a square block, or two 2 by 4 10-inch blocks arranged crosswise, for a base; the standard or vertical block having a slot in the top for the truss rod of rear axles, and being braced on either side with pieces 2 by 4 extending diagonally from the base to its sides. In the lower portion of Fig. 1, some blocks of original design are shown which are in daily use in the repair shop of the Chicago branch of the Franklin company. They are of the utmost simplicity, being comprised of but two blocks nailed together to form a T. When piled one upon another, they form a very secure rest, the height is adjustable by adding or removing a block or two, and there are many other ways in which these blocks can be advantageously employed.

Balancing New Pistons

How many of the motor car repairmen throughout the country compare the weight of each and every piston and connecting-rod that they replace in a motor with the rest to see that all reciprocating parts are properly balanced? How many of the repair shops that claim to be properly equipped, even have a pair of scales for this purpose? Let each repairman answer to himself. The balance of the high-speed internal combustion motor such as now is used in the motor car, has been one of the most difficult problems the motor engineer has been required to solve. Few motorists and repairmen realize the forces that exist in a motor when the reciprocating parts such as the throws of the crankshaft, the connecting rods, pistons, etc., are moving at high speed, the resistance which their momentum sets up to the arresting of their movement at each end of the stroke is enormous, and can be overcome only by very heavy design or by most careful balancing of the moving parts, so that their momentums act in opposite directions and counteract each other.

A flywheel that is improperly balanced will cause excessive vibration. The same will be true of a clutch mechanism whose parts are not properly balanced. In the reciprocating parts, vibration is overcome by making two moving parts of approximately the same weight, move in opposite directions. Thus, in a double opposed two-cylinder engine, the pistons always move in opposite directions. From this is seen that balance in a motor is a very important factor.

In Fig. 2 is shown the method employed by a Chicago repair shop, in testing the balance of pistons. If a new piston is fitted in an engine, it must correspond in weight to that of the other pistons. Should a new piston prove to be lighter than the others it would be rejected, and if too heavy, either a little of the metal would be turned off below the ring grooves, or holes would be drilled through it at intervals as indicated at H.

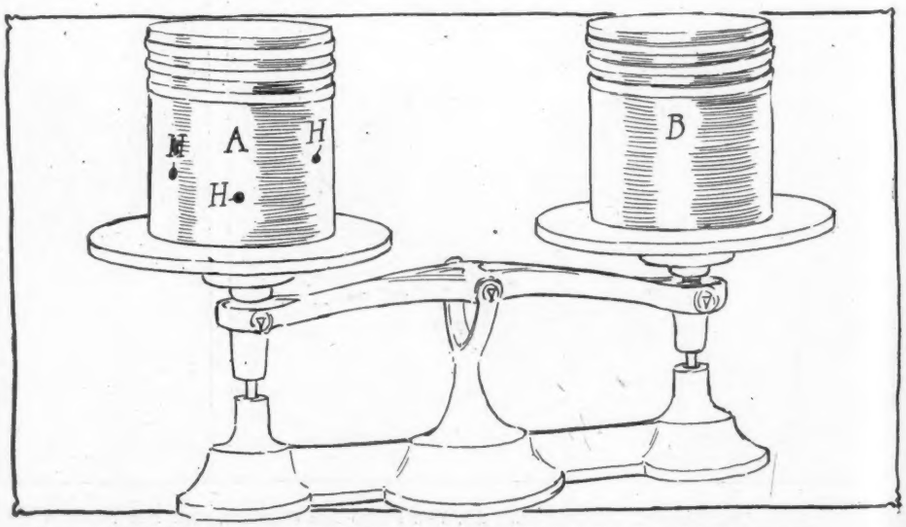


FIG. 2—BALANCING PISTONS IN REPAIR SHOP OF FRANKLIN BRANCH, CHICAGO

Current Motor Car Patents

VEHICLE-SPRING Fastener—No. 977,934, dated December 6; to Walter Bertram Cook, Medicine Hat, Alberta, Canada—This patent relates to a novel means of securing the springs of a vehicle to the axles. It is a radical departure from the ordinary types of spring attachment, and has a number of commendable features. As illustrated in Fig. 1, it comprises a seat upon which the spring S is placed, a clip C embracing the spring and seat and having openings in one side and open-ended slots S in the opposite side. Cam lock bolts B are mounted in these openings with their cam portions K in engagement with end portions of the seat, and having arms at one end of the cam lock bolts; yoke bolts are pivotally connected to the ends of these arms and turn buckles are provided for drawing up these bolts.

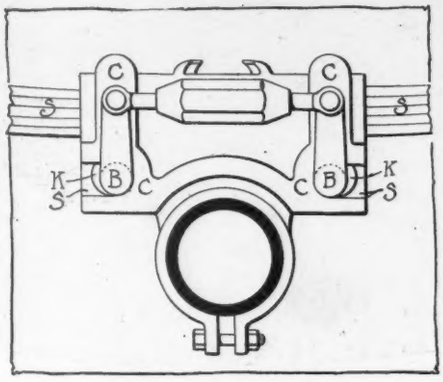


FIG. 1—NOVEL SPRING CLIP

Another Floatless Carbureter—No. 978,076, dated December 6; to David M. Tilden, Springfield, Mass.—The carbureter, Fig. 4, covered by this patent has no float and is interesting on account of the simplicity of its design. The main air intake is at A; fuel enters at F; M is the mixing chamber; and the gaseous mixture formed is designed to leave the carbureter at G. The main casing C has partitions above and below the mixing chamber M with openings O in them. Inside of this main casing and conforming to its shape is another casing or drum D which also has apertures or openings DO at the top and bottom and in its sides as well. This drum is free to oscillate inside the casing, its movement being controlled by the arm R which is secured to it, and which works in a slot in the main casing C. The openings in the side or circumference of the drum are arranged so as to register with similar openings in the circumference of the main casing, and an auxiliary air supply is thus formed. In operation, the air-currents that enter at A pass through the openings O and DO in the bottom of the drum and casing, strike the disk K, which is a part of the needle valve, and raises it, permitting fuel to enter the mixing chamber. The fuel that enters spreads itself over the under portion of the valve disk and part of it passes through the openings S in a fine spray. The valve is normally kept closed by a small coil spring P, the tension of which is adjustable by means of an adjustable valve-stem guide E, and the opening of the valve is adjustably limited by a stop T in the guide E.

New Style of Valve-Actuation—No. 977,885, dated December 6; to Joseph Valentin Laviolette, Amsterdam, Netherlands—The motor to which this patent relates differs from the ordinary T-type of motor design in that instead of employing two long cam-shafts arranged longitudinally on either side of the case, there are two short shafts mounted crosswise of the crankcase between the bottom ends of each pair of cylinders, as shown in Fig. 3. The cam shafts T are disposed at right angles to the crankshaft C of the motor, and each shaft has a helical gear H mounted centrally upon it. These gears are driven off of larger helical gear wheels W mounted on the crankshaft. A cam K provided at one end of each shaft controls the inlet valve tappets of two cylinders and the exhaust valve-tappets of each pair of cylinders are controlled by cams on the other ends of the shafts; the crankcase having openings to provide for access to the valve operating mechanisms and closure plates for the openings.

Carbureter Design—No. 977,813, dated December 6; to Charles A. Marrder, New York, N. Y.—This patent relates to a carbureter for producing explosive mixtures of constant proportions. As illustrated in Fig. 2, it comprises a mixing chamber M with an air intake C, a fuel supply pipe P with a nozzle Z at the top of it, a movable nozzle ZI forming an auxiliary storage chamber for the fuel, an adjustable fuel supply regulator or needle valve N within this chamber and depending down into the nozzle Z, and a lever operatively connected with the movable nozzle at A, which is adapted to move it and the needle valve within up and down on the supply pipe so that both the air and fuel supply may be regulated and stopped by the operator. The air is admitted into the chamber C; the movable nozzle ZI has a plurality of discharge orfices O; and in operation the air which rushes up past these orfices draws fuel therefrom in the form of a fine spray. When the nozzle ZI is lowered completely, the opening at the top of the chamber C and the orfices O are closed simultaneously.

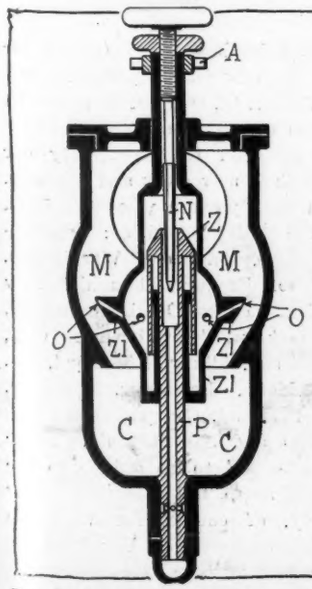


FIG. 2—CARBURETER DESIGN

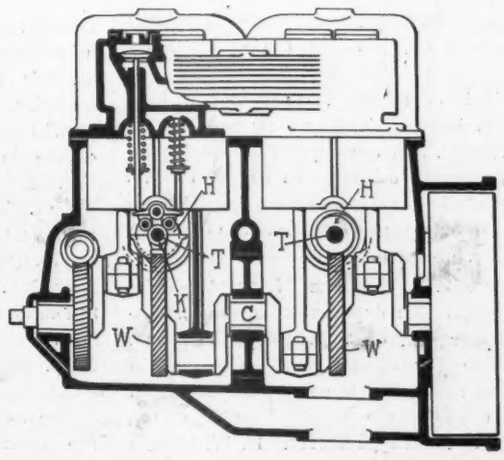


FIG. 3—NEW STYLE OF VALVE ACTUATION

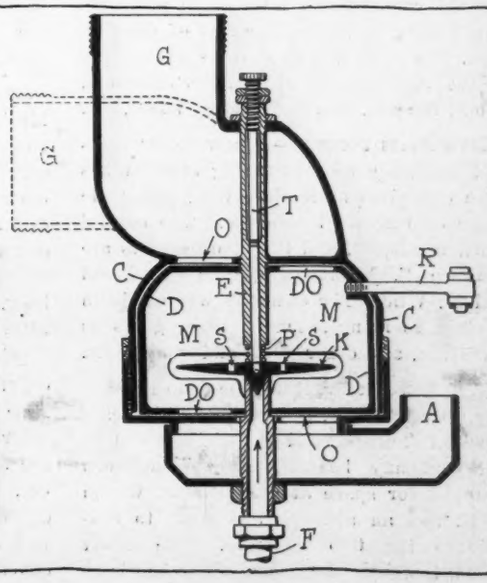


FIG. 4—ANOTHER FLOATLESS CARBURETER

AMONG THE MAKERS AND DEALERS

PLANT OF THE FEDDERS MFG. CO. OF BUFFALO IN ITS COMPLETED STATE

BAKER Joins P. & S.—Cassius F. Baker, formerly of the American Motor Car Co., is now connected with Palmer & Singer Mfg. Co. as general factory representative.

Renault Salesrooms Moved—The New York Renault salesrooms have been removed to the Demarest building at Broadway and Fifty-seventh street, where 10,000 square feet of floor space is available.

New E-M-F Advertising Man—Henry Knott, who, for the past 3 years has been associated with the Frank Seaman agency, has been appointed advertising manager of the E-M-F Co., with headquarters in Detroit.

Woodruff with Pierce—A. A. Woodruff has accepted a position as superintendent of coach work at the Pierce-Arrow Motor Car Co's. factory in Buffalo, New York. Woodruff has been for the last 3 years connected with the E. R. Thomas Motor Co., and previous to that time was in business for himself.

Fedders Completes Additions—The Fedders Mfg. Works of Buffalo has completed the additions to its plant thereby increasing the capacity more than 100 per cent, now having 100,000 square feet of working area. The plant will be devoted exclusively to the manufacture of Fedders radiators, hoods, fenders, tool and battery boxes, etc.

New Parts Concern—A new motor parts and accessory manufacturing concern has been organized at Racine, Wis., under the name of Universal Mfg. Co. The capital stock is $25,000, and the incorporators are Wallace F. MacGregor, Elbert B. Hand and M. Wild. The company will establish a plant to manufacture steering gears as a feature, and other parts and accessories.

Will Increase Capital—The Ohio Electric Car Co., of Toledo, has decided to increase the capital stock from $75,000 to $300,000. The company has for some time been cramped for space at the Milburn wagon plant, and an attempt was made to consolidate the two concerns. The effort failed, however, and a committee has been appointed to locate a site upon which the concern will erect a thoroughly modern plant, and go after business on a larger scale. Material has already been ordered to build from 500 to 1,000 cars the coming season.

Making New Runabout—The G. J. G. Motor Car Co. of White Plains, N. Y., is making a 24-horsepower model that will be known as the G. J. G. Junior and which will be made in runabout form, selling at a low price.

Brauns Makes Change—C. K. Brauns, sales manager of Clark Power Wagon Co., has joined the advertising staff of the Automobile Trade Directory, having charge of the Chicago territory. He succeeds George H. Kaufman, who has had this territory for years but who has taken the Chicago territory for the Engineering Review.

Detroit Change—The Ackerson Engineering Co. has taken over all the interests of the Merle MacFarland Co. of Detroit and now is prepared to supply front axles, rear axles, unit power plants, motors, jackshaft and transmissions. Merle MacFarland ceased to have any interest in the concern bearing his name on November 1.

Regal Adds New Department—The Regal Motor Car Co. has added a new department which will be known as the technical department, and which goes hand in hand with the repair and trouble department, and the department supplying extra parts to owners. In charge of this department has been placed Virgil Oldberg, formerly president of the Oldberg Mfg. Co. of Detroit.

Differential Business Separate—The differential gear department of the Brown-Lipe Gear Co., of Syracuse, N. Y., will, after the first of the year, be located in the new factory of the Brown-Lipe-Chapin Co., in which the Brown-Lipe Gear Co. owns a controlling interest. H. W. Chapin will serve as general manager of both concerns and will have the same selling organizations for both factories. The trade is requested to address all correspondence relative to differential gears to the Brown-Lipe-Chapin Co., and correspondence relative to transmissions and steering gears to the Brown-Lipe Gear Co. after January 1.

Officers Elected—C. O. Hamilton, of Sayrick, O., was elected president of the National Gas and Gasoline Engine Trades Association, which met at Racine, Wis., last week. The other officers elected are: Vice-president, A. C. Parker, Racine; secretary, Adolph Strictmatter, Cincinnati, O.; treasurer, O. M. Knoblock, South Bend, Ind. The semi-annual session will be held in Detroit next June.

Denies Bate Has Resigned—In answer to rumors circulated at Racine, Wis., William Mitchell Lewis has issued a vigorous denial that John W. Bate, superintendent of the Mitchell-Lewis Motor Co., has resigned. It is believed that Mr. Bate's absence in California brought out the report. Captain Lewis said that Mr. Bate is a large stockholder in the corporation and is his private conferee in its management.

Goodrich Wholesale Stock Depots—After the first of the new year the B. F. Goodrich Co. of Akron, O., will put in operation a new system of distributive service machinery in addition to the twenty-four branches which it now owns and operates. It will open twenty-seven wholesale stock depots in the following cities: Milwaukee, Des Moines, Baltimore, Washington, D. C., Toledo, Dayton, Memphis, New Orleans, Oklahoma City, Omaha, Columbus, Louisville, Jacksonville, Salt Lake City, Brooklyn, Newark, Albany, Richmond, Va., Springfield, Mass., Rochester, Syracuse, Providence, Portland, Grand Rapids, Saginaw, Houston and San Antonio. These depots are intended to be a help to the dealer as well as to the consumer. They are primarily, of course, for wholesale trading. The consumer will buy from the local dealer just as he always has done. No depot will be in competition with a

dealer, but the user will get better service from his dealer, for the latter can be more quickly accommodated by a source of direct supply in his own territory. At the same time the dealer will not have to carry a large stock; he can get prompt service from the depot.

Moves Its Offices—The executive offices of the Licensed Automobile Dealers of the city of New York have been removed from the Thoroughfare building to the eleventh floor of Motor Hall, 250 West Fifty-fourth street. Charles A. Stewart is the general manager.

Schacht in New Plant—The Schacht Motor Car Co. of Cincinnati is installed in its new plant and is turning out four-cylinder cars at the rate of ten a day. The present factory is three times as large as the old plant with acreage for increasing to four times their present capacity.

Removed to Larger Quarters—Owing to greatly increased business the H. W. Johns-Manville Co. announces the removal of its offices, now located at 85 Shelden street, Houghton, Mich., to more commodious and convenient quarters at 96 Shelden street. S. T. Harris, who has been associated with the company for a number of years, will be in charge of the offices at the new address.

Another United Motor Branch—The United States Motor Co. has opened a branch house in Salt Lake City, Utah, under the management of Vernon K. McMains. It will be conducted as a sub-branch of the United Motor Los Angeles Co. Maxwell and Columbia cars will be sold through this establishment. Temporary quarters now at 121 South State street, will soon be replaced with a new building.

Jeffery Using Electric Power—The new electrical power plant of the Thomas B. Jeffery Co., at Kenosha, Wis., is now in service and all machinery is using electric drive. The engine room covers 6,000 square feet and the boiler room 8,000 feet. There are four units, including one 1,200 horsepower cross-compound non-condensing alternator, one 500, one 125 and one 100 horsepower each. Three boiler units of 500 horsepower each with automatic stokers and a complete coal-handling equipment are installed in the boiler house.

Change in Uncas Company—Announcement is made that B. F. Leavitt has resigned as manager of the Uncas Specialty Co. of Norwich, Conn. F. W. Browning will take active charge as president, assisted by Robert R. Keith, who becomes general manager. The company handles ignition specialties and parts.

Moline Men on Tour—C. H. Van Dervoort, sales manager of the Moline Automobile Co., and F. G. Salisbury left December 13 for the south where they will visit retailers and install new agencies. At Memphis they will begin the inspection tour proper in a 1911 model Moline. Chattanooga, Birmingham, Montgomery and New Orleans will be among the towns visited.

Windfall for Mechanic—E. L. Reinhart, of Roanoke, Va., an expert mechanic in the plant of the Thomas B. Jeffery Co., at Kenosha, Wis., has been advised that he will share with his father and uncle in a $3,000,000 estate bequeathed by a grandfather in Germany. Reinhart is only 21 years old, and left home to learn the motor car business, refusing to continue in college. He will not leave the Rambler works until the proofs of the inheritance are shown him.

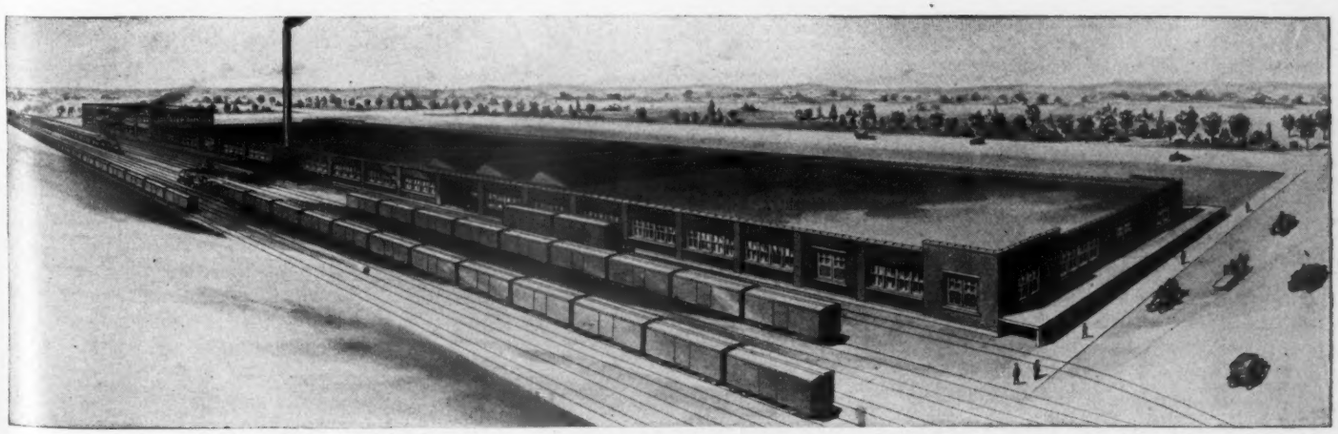
Russian Medal for Mitchell—The Russian government has just awarded a Mitchell motor car a silver medal as the "most perfect popular-priced car known to the engineers of the czar's empire." William Turner Lewis, former president of the Mitchell interests in Racine and at present in Paris, cabled to his son, Captain William Mitchell Lewis, president of the Mitchell-Lewis Motor Co., this information: "The exhibit of motor cars in St. Petersburg," said James W. Gilson, sales manager of the Mitchell-Lewis company, "received government patronage. The czar's industrial engineers were eager to exploit popular-priced cars. Many makers were invited to participate in the exhibition. Our additional cablegram information from the Russian capital is that after careful consideration, covering first, cost, quality of workmanship and material, maintenance, performances, elegance of design, safety factors in brakes, economy of power and fuel, etc., the Mitchell easily carried off the only medal of the kind offered by Russia."

Boston Change—The Automobile Appliance Co. of Boston has purchased the business of the Couch & Seeley Co. and the Transfer Issuing Machine Co. The officers of the new concern are: F. H. Whitman, president; A. D. Claflin, treasurer, and R. L. Whitman, general manager. The company will be located in the plant of the Couch & Seeley Co., at 162-172 Columbus avenue, Boston.

Jewel Receiver Discharged—The Jewel Carriage Co. which went into the hands of receivers under date of June 24 owing to excess stock of material has been able to make arrangements with all of its creditors whereby the receivership was lifted December 12. The capital stock has been increased to $450,000, $400,000 of which has been paid in. The Jewel Carriage Co. is the manufacturer of the Ohio car sold by the Ohio Motor Car Co.

Getting Plant in Shape—Workmen in the old Bement plant on Grand avenue, Lansing, Mich., where the new Reo truck and the R-O car are to be manufactured, are fast whipping the place into shape so work can begin there very soon. At present the factory at Detroit is being dismantled, the equipment being shipped to Lansing. At the new factory the milling machines have been practically all placed ready for furnishing the power necessary to run these.

Suit Discontinued—It is reported from Pontiac, Mich., that the $100,000 suit brought by the Pontiac Buggy Co. against the Oakland Motor Car Co. and the General Motors Co. recently has been discontinued. The case was started by the directors of the buggy company for the purpose of securing the indorsement of the General Motors Co. on the paper given the Pontiac Buggy Co. when the Oakland Motor Car Co. took over the buildings owned by the Pontiac Buggy Co. in the city of Pontiac.



VELIE COMPANY OF MOLINE HAS A COMPLETE PLANT, WHICH INCLUDES AN ENGINE-MAKING DEPARTMENT

Development Briefs

Small Parts Described

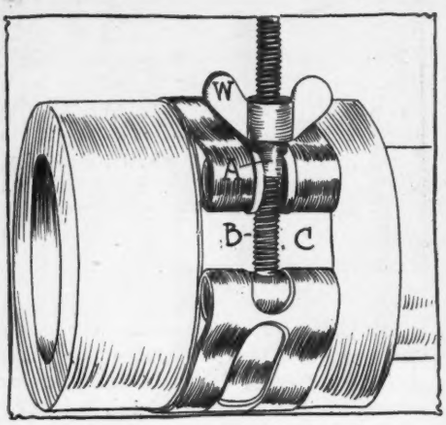


FIG. 1—CATELAIN HOSE CLAMP

LOOSE-TUBE RADIATOR

THE loose-leaf ledger has become a recogniged factor in the business world and its running mate has appeared in the motor-car sphere in the form of a loose-tube radiator. This being a multiple-tube construction, as Fig. 2 shows, in which one of the vertical sections may be taken out, if damaged, and a new one replaced without much loss of time; in fact, should an accident damage all of the twenty-five of the vertical tubes they could be removed and others put in their place. Should a tube become damaged and the car owner not have an additional tube along with him, the tube can be left out, and by plugging two holes the radiator may be used minus one or more tubes. Each of what appears to be a single vertical unit, Fig. 2, is in reality four vertical tubes extending from the front to the back of the radiator. The water, in flowing through each tube from the top to the bottom, follows a zigzag course which is used in order to increase the amount of tube surface exposed to the air. The Behringer Radiator Works, Ticonderoga, N. Y., is the maker.

In Fig. 7 is shown the details of this loose-tube radiator construction. H shows the upper header, familiarly known as the water tank, and at the bottom of the radiator is a similar construction. T shows one of the loose tubes, consisting of the body part B, which is made up of four zigzag tubes placed side by side. The water passing from the header takes the course indicated by the arrows. A tobin bronze screw S holds the set of four tubes B to the header, the union having a common round rubber gasket to form a watertight joint. A similar construction is employed at the base where the union is made with the bottom water tank. There is an additional stud support for the tubes B so that the entire weight is not all taken on the tobin bronze screw S.

In the manufacture of the sections B an interesting detail or two is made use of. The tops of the four tubes, forming the

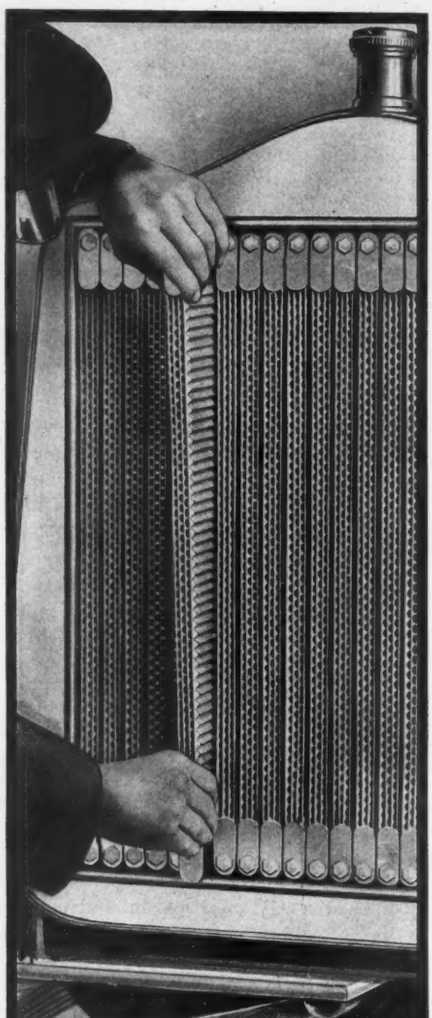


FIG. 2—REMOVING A TUBE FROM THE BEHRINGER LOOSE-TUBE RADIATOR

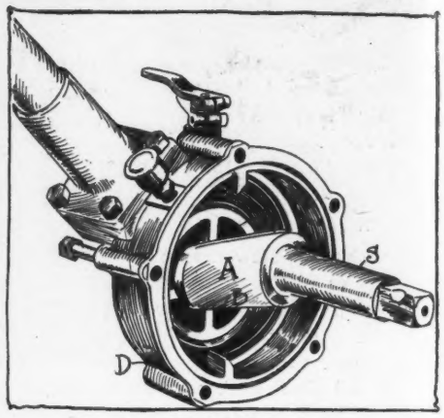


FIG. 3—BROWN STEERING GEAR

section, are seen, and the front and rear ends of each tube are united by a lapped joint, complete in four operations, so that when the joint is complete there are five thicknesses of metal in it. The four operations are seen at 1, 2, 3 and 4. This illustration also shows a zigzag formation, showing the four paths for the water, each of which is an extremely thin passage. The large square air spaces A also are shown. Each section of four tubes carries at its upper and lower end a manifold cap which is soldered in place and receives the water flow from the four tubes at the bot-at its upper and lower end a manifold cap T at the top supplies water to the four tubes.

SIMPLEX OIL INJECTOR

Raymond C. Agner & Co., Burlington, Wis., are marketing a very speedy and clean combination oil and grease gun which contains two or three features of special merit. The gun is shown in Fig. 4 to consist of a barrel B within which works a piston attached to the end of the plunger rod or rack R. If desired when thin grease or oil is used this piston can be forced down by the T end on R, but if

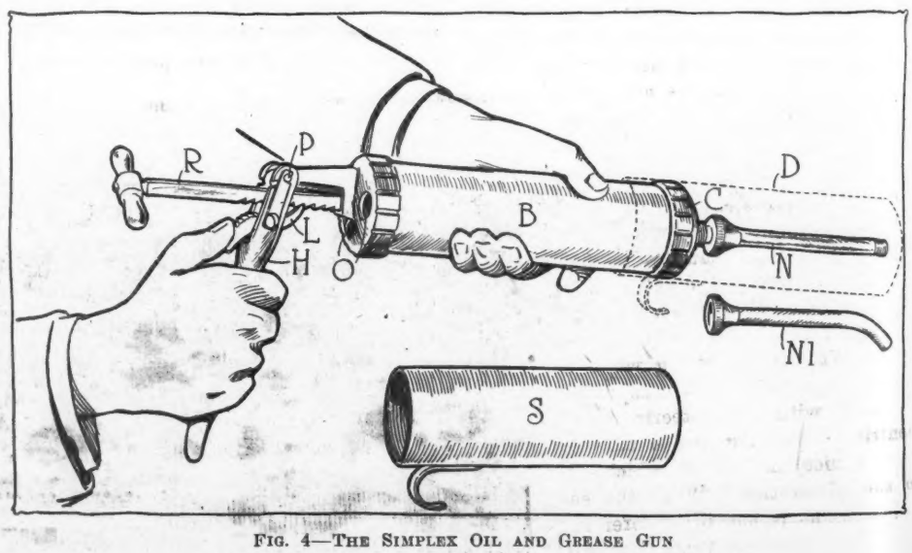


FIG. 4—THE SIMPLEX OIL AND GREASE GUN

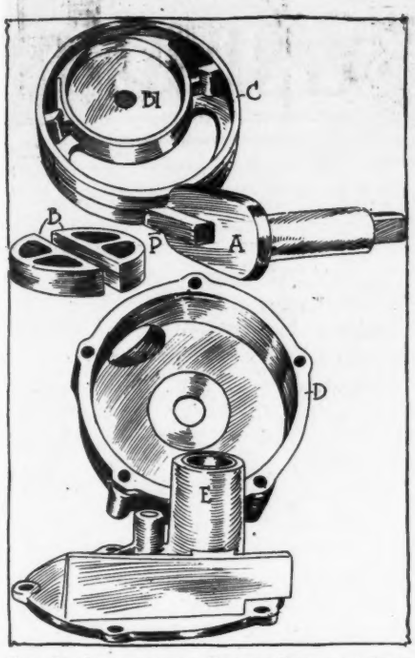


FIG. 5—ASSEMBLY OF BROWN STEERING GEAR

thick grease is used the plunger is forced down by the handle H, which pivots at P to a support on the cover of the gun. This handle has a latch L which works in the serrations in the plunger rod R. This lever gives a very speedy action, it only requiring a few seconds to force the plunger down. Two nozzles N and N1 can be used, each threading onto the cover end C of the gun.

There is one more detail of the gun which must not be overlooked and that is the ease and cleanliness with which it may be refilled. To refill the end cover C is taken off and a filling sleeve S is slipped over the barrel B. This filling sleeve is used only to keep the barrel clean. With the sleeve outside of the barrel the open end of the barrel can be forced into the grease and the barrel filled. The sleeve is then withdrawn and the barrel B is as clean as before the filling operation began.

NO. 3 TRUCK JACK

The Elite Mfg. Co., Ashland, O., is marketing a new truck jack known as No. 3, specially designed for light as well as heavy motor trucks. This jack has a 6-ton lifting capacity and is 13 inches high and weighs 17 pounds.

BROWN'S STEERING GEAR

The Baldwin Chain & Mfg. Co., Worcester, Mass., is marketing the Brown steering gear, which contains many details different from those found in other steering gears. Figs. 3 and 5 show the leading details, although some of the essentials are not shown. When the steering wheel is turned to the right or left it turns an eccentric piece C within the steering gear, this eccentric piece being turned through a gear and pinion, neither of which appears in the illustration. When the eccentric piece turns it has to transfer its movement to the ball arm, which is done as follows: The shaft S has an offset or

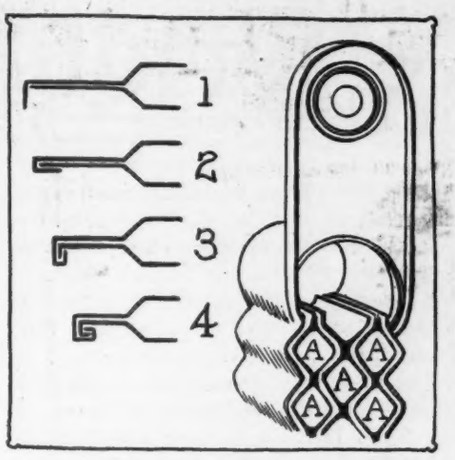


FIG. 6—BEHRINGER RADIATOR SHOWING FOUR STAGES IN TUBE JOINT, ALSO AIR PASSAGES

check A, on the face of which is a projection P. This projection works between two cheek pieces B, which fit within the circular space B1 of the eccentric piece. The ball arm is a square fit on the end of the shaft S. So much for the details of design. Next comes the modus operandi, just how it works: As the eccentric piece revolves the cheek pieces B contact with the projection P, and this projection is carried around with the eccentric, the axis of rotation being the shaft S. As this shaft rotates the ball arm is carried back or forth, transmitting the desired movement to the steering wheels.

With this steering gear the degree of locking or irreversibility is secured by the location of the cheek pieces B relative to the center of the eccentric piece. The nearer the cheek pieces are to this center the greater the locking effect. The maker claims that the parts can be so arranged that a uniform motion may be obtained between the hand wheel and the ball arm. The object of this gear is that the parts subjected to heavy shocks and wear are provided with large wearing surface, so that the teeth of the gear and pinion are relieved of that hammering they ordinarily receive. In this Brown steering gear the thrusts are taken on broad and curved faces rather than along the straight lines

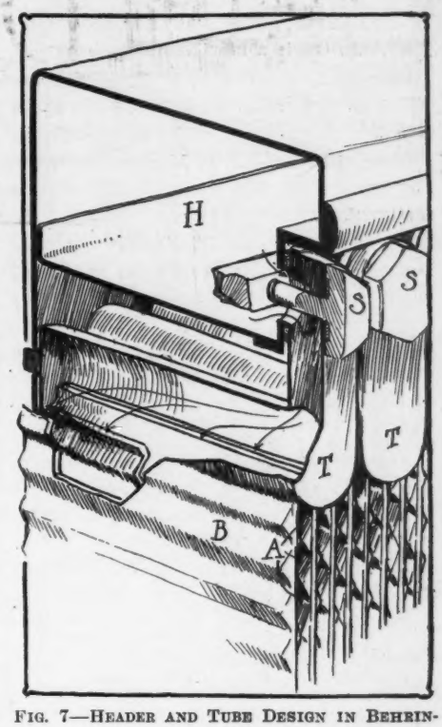


FIG. 7—HEADER AND TUBE DESIGN IN BEHRINGER RADIATOR

of the teeth in gears and sectors, or worms and gears. The complete gear is housed in a two-part casting as shown in the accompanying illustration.

CATELAIN HOSE CLAMP

A. Catelain, 1446 Indiana avenue, Chicago, Ill., manufactures the Catelain hose clamp, Fig. 1, which has an advantage in that it can be adjusted to different sizes of rubber or other hose. It can also be used to clamp an oblong piece as well as a circular one. It consists of a copper band B ¾-inch wide, which is drawn tight by a screw B and a wing nut W. On the screw B is a bushing A, which must be in a countersunk hole before the wing nut is tightened. A brass flap C is used at the union to prevent the hose wrinkling. This flap is slipped in place before the clamp is tightened. Owing to the length of the screw B, a hose of large diameter can be connected with this clamp which will hold it in position firmly.

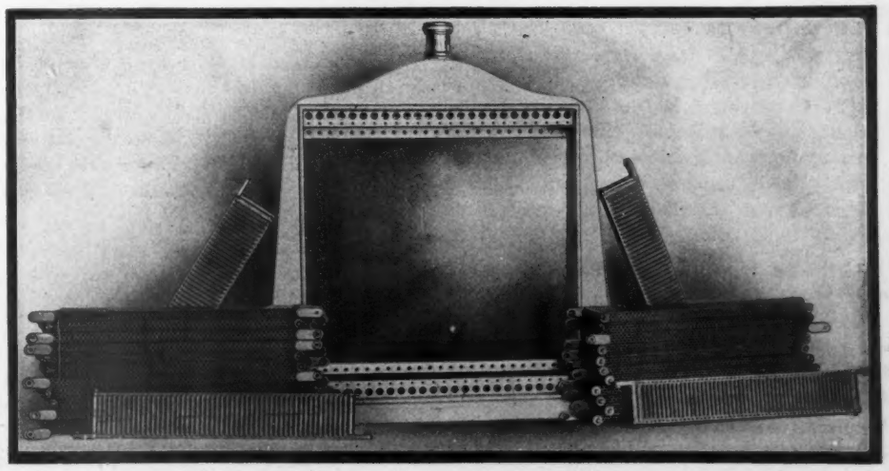


FIG. 8—THE FRAMEWORK WITH ALL TUBES REMOVED IN BEHRINGER LOOSE-TUBE RADIATOR

Brief Business

APPLETON, WIS. — The Griffin-Scott Auto Co. is a new Rambler agent.

Cleveland, O.—The R. S. L. garage has been opened at 1970 East Fifty-ninth street.

Greenville, Ky.—J. P. Morgan has taken the agency for the Maxwell cars in this territory.

St. Louis, Mo.—David Gilliland has been installed as house manager for the retail department of the Phoenix Auto Supply Co.

Racine, Wis.—The new four-story brick building for the body department of the Mitchell-Lewis Motor Co. has been completed.

Trenton, N. J.—The new showrooms of the Stoddard-Dayton Co. at 27-29 North Warren street have been opened under the management of Norman P. Druck.

Baltimore, Md.—The B. F. Goodrich Tire Co., of Akron, O., has established an agency in Baltimore, with the wholesale depot at 1127 West North avenue.

Jacksonville, Fla.—J. W. Bishop, J. C. Bishop and C. N. Griffin have formed a partnership, with headquarters in this city, to be known as the Rambler Automobile Co.

Omaha, Neb.—The Clark Sales Co. is a new concern in Omaha. H. W. Pope is manager of the company, which is located at 2025 Farnam street. The Clark car is sold.

St. Louis, Mo.—The Woods Electric Vehicle Co. has been incorporated. The capital stock is $2,500, fully paid. The company announces its purpose to manufacture and deal in motor cars.

Moline, Ill.—Among the agencies of the Velie Motor Vehicle Co. recently established are the Central Motor Car Co., Hamilton, O.; Robinson & Baylor, Scranton, Pa., and George E. Maurer, Freeport, Ill.

Racine, Wis.—The Reliance Engine and Iron Co. is considering a proposition to move its plant to La Crosse, Wis. The company employs 125 skilled men, has a capital of $40,000 and was organized in 1903.

Louisville, Ky.—A. W. Woodruff, formerly of the F. B. Stearns Co. of Cleveland, has gone to Nashville to take charge of the Southern Motor Works as sales manager to handle the Marathon. W. F. Anderson, who has looked after this end of the business up to this time, will hereafter devote his time to the mechanical end of the plant.

Philadelphia, Pa.—In addition to the wholesale and principal headquarters located at Eighteenth and Spring Garden streets the Studebaker company will establish a retail sales department and showroom at 334 North Broad street, the same building occupied by this company prior to the removal to the Eighteenth and Spring Garden streets location. Expansion of the business in both gasoline and electric cars demands the additional space.

Columbus, O.—The Vim Motor Mfg. Co. of Sandusky has increased its capital from $25,000 to $60,000.

Cleveland, O.—V. R. Hall has taken the agency of northern Ohio for the Universal tire protector.

Wallace, Idaho—St. Jean & Boggs have secured the agency for the Chalmers car and are installed in their new concrete garage.

Prairie du Chien, Wis.—The Prairie City Garage Co. is building a garage here. It will handle the Brush and conduct a livery business.

St. Louis, Mo.—The St. Louis Top Co. has increased its capital stock from $2,000 to $6,000, paid up; the assets are given at $13,036.77, and the liabilities at $2,903.81.

Philadelphia, Pa.—The new showrooms of Seltzer & McGowan, local agents for the Firestone-Columbus and Columbus electric, have been opened at 156 North Broad street.

Spokane, Wash.—The Ford Motor Co.'s Spokane headquarters now are located at 1223 Sprague avenue, a large two-story garage having recently been completed at that point.

Philadelphia, Pa.—The Regal Sales Co., a new organization, at 330 North Broad street, Walter G. Herbert, general manager, has secured the agency for Regal cars in Philadelphia and vicinity.

Cincinnati, O.—H. M. N. Muhle, of the Muhle-Louis Automobile Co., has acquired the entire stock of J. H. Louis, of the same company. The Muhle-Louis company will enter its new building at 1035 Race street this week.

Eau Claire, Wis.—The Tanberg Automobile Co., one of the largest distributing agencies in Wisconsin, has filed an amendment to its articles of incorporation, increasing the capital stock from $25,000 to $50,000.

Akron, O.—John W. Kelly has taken the position of general factory representative with the Swinehart Tire and Rubber Co. and will give his attention to special solid tires for truck and pleasure electrics. Mr. Kelly formerly was with the Edison Storage Battery Co.

Des Moines, Ia.—D. P. Ayres, president of the National Rubberette Co., was in this city recently completing preparations for establishing a plant for treating tires with a puncture-proof material. Mr. Ayres is now organizing a company with a capitalization of $25,000. He stated that he had already assisted in organizing a company at Davenport, Ia., with a capitalization of $25,000, which is already treating tires. He hopes eventually to establish plants in all of the large cities.

St. Louis, Mo.—F. A. Babcock, formerly of Syracuse, has taken charge of the Franklin Automobile Co. here.

Pittsburg, Pa.—The F. B. Stearns Co., of Cleveland, has established a Pittsburg branch on Penn avenue, east end.

Myersdale, Pa.—T. W. Gurley and his brother, Otto C. Gurley, have formed a partnership and will engage in the motor car business.

Louisville, Ky.—The Banks Motor Car Co. will have the agency for the Ford another year, with J. B. Banks as head of the company.

Baltimore, Md. — The Mount Vernon Motor Car Co. has been named as the Monumental City agency for the Regal. The some company also represents the Autocar.

Washington, D. C.—The Luttrell Co., agent for the Packard, is established in its new salesrooms at the junction of Connecticut and New Hampshire avenues and Dupont circle.

Cincinnati, O.—The Imperial Motor Car Co. has incorporated at Columbus, O., with a capital stock of $150,000, to own and operate garages and to deal in cars and accessories thereto.

Vinton, Ia.—J. P. Whitney, Charles Fortmyer and Charles Henderson have organized the First Implement and Automobile Co., handling the Overland. The company has built a 50 by 100 brick garage.

Boston, Mass.—F. Carleton Dole is the latest addition to the salesforce of the F. E. Wing Motor Car Co. in Boston. He had been manager of the Royal Tourist branch and later with the Brush runabout in Boston.

Philadelphia, Pa.—The G. Hilton Gantert Co., Philadelphia distributor of the Stearns and Selden cars, has removed from 510-512 North Broad street to larger quarters at 447-451 North Broad street, corner of Buttonwood.

Salt Lake City, Utah—The United States Motor Co., of New York, has placed a branch house in this city under the management of Vernon K. McMains. The office will retail the Maxwell and Columbia cars. The company will make preparations for erecting its own building in the spring.

Boston, Mass.—The Taylor Motor Sales Co., selling the Herreshoff, has secured three salesmen in Birney A. Robinson, formerly with the White; Everett F. Prior, who had sold Premier cars, and Richard I. Dwyer, who had been with the Marmon.

Boston, Mass.—The Davis Automobile Co., which has the agency for the Lexington cars, has secured F. K. Leatherbee for

Announcements

its salesforce. He was formerly manager of the Morse agency in Boston.

Spokane, Wash.—H. F. Preston, manager of the Regal garage, has taken the agency for the Gramm motor trucks.

El Paso, Tex.—The Western Motor Supply Co. has been established by P. J. Savage, G. W. Kennedy and J. T. Fletcher.

Moline, Ill.—C. P. Hatter, salesman and special traveler of the Velie Motor Vehicle Co., has been promoted to assistant sales manager.

Dayton, O.—G. O. Simons, formerly of the Dayton Motor Car Co., has been appointed superintendent of the Parry Auto Co., Indianapolis, Ind.

Louisville, Ky.—A. Montenegro and A. L. McCormick, the local agent for the Hudson car, are planning the formation of the Hudson Motor Car Co. to distribute the car in this territory.

Des Moines, Ia.—G. W. Jeffrey, of Cedar Rapids, will come to Des Moines on January 1 and join his brother, W. B. Jeffrey, as partner in the firm known as the Des Moines Vulcanizing Co., located at 420 West Eighth street.

Omaha, Neb.—L. L. Pratt, who has been secretary and treasurer of the Paxton-Mitchell Garage Co. for some time, resigned his position to become business manager for Guy L. Smith, dealer in Franklin and Peerless cars.

York, Pa.—Belmont S. Falters, who left the employ of the Pullman Motor Car Co some time ago and connected with the Parry Automobile Co., of Indianapolis, Ind., has returned to the Pullman company and will travel throughout the middle west and southwest.

Washington, D. C.—Irving C. Barber, Edwin Hilliar and Gordon Gregg, individually and as copartners in the Irving Garage Co., have filed a voluntary petition in bankruptcy. The assets are placed at $4,656, with liabilities amounting to $6,185. The company was agent for the Parry.

Indianapolis, Ind.—J. P. Primrose has accepted the position of assistant sales manager of the Willys-Overland Co., with offices at Indianapolis. This position formerly was held by William D. Myers, who is now assistant sales manager of the Marion Sales Co., also located at Indianapolis.

Atlanta, Ga.—The Fulton County Auto Supply Co. has been reorganized. Hereafter this company will handle the Speedwell, Marmon, Gramm truck and Peerless for Georgia, the Hudson for north Georgia, and the Columbus electric for Atlanta. J. W. Goldsmith, Jr., has been elected president of the company, Carl W. Fort, vice-president, and Andrew Calhoun, secretary and treasurer.

Davenport, Wash.—O. W. Stone has been appointed Ford agent at Davenport, located in the heart of the wheat belt.

Seattle, Wash.—The Metropolitan Motor Car Co was recently re-incorporated and S. M. Ament named as its new manager.

Amesbury, Mass.—I. H. Atwood, formerly of the Atwood Mfg. Co. and later factory manager of the Castle Lamp Co., has resigned.

Oroville, Wash.—Charles T. Peterson has secured the agency for the McFarland six in eastern Washington, British Columbia and northern Idaho.

Pittsburg, Pa.—The Westinghouse Electric and Mfg. Co. is preparing plans for a five-story building in East Pittsburg which will, it is said, be used for the manufacture of motor cars.

Chicago—The Booth Demountable Rim Co., of Cleveland, O., has opened a branch here under the management of J. W. Benton, at 2129 Michigan avenue.

St. Louis, Mo.—The Haynes Automobile Co. has increased its capital stock from $5,000 to $15,000, fully paid. The company's assets are given at $16,293.72; its liabilities at $8,223.91.

Indianapolis, Md.—J. V. Thomas, recently connected with the sales department of the Mora company, has been engaged as traveling representative of the American Motor Car Co.

Indianapolis, Ind.—Fairbanks, Morse & Co. have been appointed Canadian representatives for the Schebler carbureter and will carry stock at Montreal, Toronto, Winnipeg and Vancouver.

Portland, Me.—The Mank-Stuart Motor Car Co., distributor of Cadillac cars, finds its business has warranted it taking over the former Portland motor mart. The garage will be 270 by 130, with basement.

Rockford, Ill.—The Ford Motor Sales Co. has taken the agency for the Ford car in Boone, Winnebago, Stephenson and Jo Daviess counties. W. F. Barnes is president and treasurer of the concern and W. F. Barnes, Jr., general manager.

Spokane, Wash.—S. M. Smith, of the Elmore Motor Co., of Spokane, has received the agency for the states of Washington and Idaho for Elmore cars. He is having a new garage built which will house from 200 to 300 cars of this make.

St. Louis, Mo.—The Moon Motor Car Co. announces the appointment of the following agencies: Carson & Thatcher, Iowa City, Iowa; Cedar Valley garage, Waterloo, Iowa; Kenning Brothers, Sigourney, Iowa; Robert Nicholls, Mark, Tex.; Brown Motor Car Co., Lincoln, Neb.; Kiel & Evans, Oakland, Cal.; C. D. Pope, Hydro, Okla.; E. Zimmerman, Stonington, Ill.

St. Louis, Mo.—The Colonial Automobile Co. has taken the St. Louis agency for the Brush.

Washington, D. C.—The Automobile Owners' Supply Co. has opened a store at 1903 Fourteenth street, and will conduct an accessory business.

Des Moines, Ia.—The Musgrave Fence and Auto Co. has moved from its old location at Second and Market streets, to new quarters at 907 Walnut street.

San Francisco, Cal.—The Frank O. Renstrom Co. now is located and in full operation at the southwest corner of Van Ness and Golden Gate avenue, where it had its branch before its garage on Stanyan street was destroyed by fire some time ago. The company is agent for the Klinekar.

Boston, Mass.—The Davis Automobile Sales Co. has been organized in Boston to handle the Lexington in Massachusetts. Edward C. Davis is president, and at present temporary quarters are located in the Motor Mart, while permanent quarters are being fitted up for the company in another part of the building.

Clyde, O.—The Clyde Auto Sales Co. will succeed M. L. Huss & Co. The new company will sell the Elmore line exclusively and act as distributor for northwestern Ohio. E. Van Benschoten, manager of M. L. Huss & Co., will have charge of the sales end and Dexter E. Perin will have charge of the garage.

Washington, D. C.—Two new motor car companies were formed in this city last week. George W. Wells & Son have temporary quarters in the rear of 1415 Rhode Island avenue and will handle the Cutting. The Schacht agency has been given to the Hinds Auto Co., temporarily located at 1315 Irving st, N. W.

Boston, Mass.—The Coburn Auto Sales Co. of Boston, which has taken on the Enger, has been incorporated with L. J. Coburn, president; L. E. White, vice-president, and Jasper L. Sackett, secretary. Until salesrooms are secured the company will make its headquarters in one of the down town office buildings.

Boston, Mass.—The Kenneth Motor Car Co. has taken over the business of the American Motor Co. of Brockton, which had its salesrooms at 173 Huntington avenue with a garage and service depot at 320 Newbury street. The company has added the Firestone-Columbus to its line, which already includes the Roader car.

Omaha, Neb.—The Marion Automobile Co. has started in business in Omaha. C. W. McDonald, formerly western manager of the Sandwich Mfg. Co., resigned his position to become manager. The firm will have the agency for Marion cars for Nebraska, northwestern Missouri, and western Iowa. It will also handle the Overland cars locally.

TIRES GIVE SURPRISING MILEAGE RESULTS

TABLE SHOWING MILEAGE RESULTS OBTAINED BY OWNERS

Make of tire	A	B	C	D	E	F	G	H	I	J
Sets reported...	41¼	43	13	12¼	8	7	6	7	4	3
Grand total, mileage	256,539	239,975	70,300	65,798	34,100	21,594	20,236	20,200	14,000	8,450
Grand average, mileage	6,221	5,580	5,361	5,371	4,262	3,084	3,372	2,825	3,500	2,816
Grand total, time in use, months	339½	404½	122½	82	93½	61½	37	46½	26	12½
Grand total, extra casings used	23	34	6	6	9	6	9	3	5	1
Grand total, extra tubes used	54	73	24	10	9	17	7	9	5	4
Average period of use, months...	8¼	9.3	9⅜	6.7	11.7	8⅝	6 1/6	6⅜	6½	4 1/6
Average monthly mileage	755.9	593¼	573⅛	802⅝	364.7	351.1	546.9	436½	538⅝	676

AKRON, O., Dec. 19—I have just completed an investigation into the merits of various makes of tires and have secured statistics from all parts of the United States bearing upon the durability of tires that gives some important facts not heretofore brought out. Perhaps the most valuable of these is that while tire adjusters employed by the tire manufacturers give 3,500 miles as the average mileage per set of tires, the reports gathered from approximately 145 different car owners show an average of 5,199¼ miles per set of tires. These figures cover nine makes of tires used on thirty different makes of cars. In the table A, B, C, etc., represent different makes of tires.

Akron being the greatest rubber tire manufacturing city in the union, it was natural that a search for tire information on a large scale involving the amount of mileage tires give, the average frequency of punctures, the average monthly mileage of tires, etc., be undertaken, and this was done in a personal and unprejudiced way.

The result of this work gives a symposium of the individual experiences of motorists whose names, taken from registration directories in practically all of the states, were selected at random, with the exception that care was taken to include owners of a great many different makes of cars; also to give every section of the United States adequate representation in order that all kinds of roads would enter into the final result. No names of tires are mentioned in such a manner as to reflect upon their merits. The result shows that a number of makes of tires are giving heroic service when the character of that service is considered.

Other general facts ascertained are of more value and importance than the name of the make that leads as a result of the investigation. Below is the tabulated substance of reports received covering 144¾ sets of tires of ten leading makes, in use in every part of the United States, and thirty different makes of cars. There were, in addition to the nine makes of tires indicated above, nine other makes represented in the reports sent. They are not included in the tabulation because of insufficient data from the owners. They ranged from one-half set to two sets of each of these several makes.

By W. A. WEYGANDT

The reports were received as follows: Several hundred letters of inquiry were sent out stating the intention of the writer to prepare data on tire service. They were sent to individual owners of cars of the following makes, apportioned as equally as possible among them: Packard, Peerless, Pierce-Arrow, Stevens-Duryea, Stearns, Locomobile, Lozier, Haynes, Oldsmobile, Stoddard-Dayton, Alco, Apperson, Buick, Chalmers, Franklin, Matheson, Maxwell, White, Winton, National, Owen, Palmer-Singer, Premier, Rambler, Royal, Thomas, Mitchell, Overland, Oakland, Cadillac.

Both large and small cities and all parts of the country were included in the inquiries, the purpose being to include every kind of condition as to road, etc., that American tires are required to encounter. The returns showed as a result, for instance, that in New Orleans tires received cuts and kinds of injuries that they did not in California, and greater durability of tires was noticeable in some parts of the United States than in others.

Although the total number of replies indicated in the table is only 145, many more reports were received, but in many information of value was lacking. Here are some of the facts the above inquiry revealed:

The average monthly mileage of the owners, found by adding the total monthly averages of each make and dividing by the total number of makes, is 563 2-5. The average number of punctures the owners must repair in the course of a summer's motoring is 3¾.

The average motorist, buying tires in an average way, as indicated by the replies sent, will have a perfect right to expect to buy a new tube, for one cause or another, for every 3,543.3 miles he travels.

Estimates of the cost of tires per mile seldom were given in reports received. Neither can they be figured from data available, for the reason that the majority of tires reported upon are still in use, or were when the blanks were filled out—some of them not very good, while others were pretty well worn.

The grand average of mileage per set during the season by all makes of tires tabulated is 5,199¼, and the average of casings replaced for all causes during the season is three-fourths of one to each set of tires in use.

If all of the 300,000 car owners in the United States made the same average mileage as the 144 whose records are available, the aggregate mileage of all motorists the past season would reach the enormous figure of 1,559,775,000 miles, equal to 62,391 times around the globe.

Gasoline consumption by motor cars, according to the averages tabulated, runs into a generous figure for the entire country. If the total number of gasoline cars is 250,000, for instance, and each averages 5,199¼ miles during the season, getting 12½ miles of service to the gallon, the amount consumed is 103,985,000 gallons. At an average of 15 cents a gallon the cost is $15,597,750.

Manufacturers' Communications

CONSOLIDATION DENIED

Milwaukee, Wis.—Editor Motor Age—In the issue of Motor Age of December 8, 1910, the following article appeared:

Milwaukee, Wis.—The W. R. Sherin Co., painting and repairing, has been consolidated with the big carriage manufacturing firm of Schueler Brothers, 247-249 Milwaukee street. W. R. Sherin will have charge of the new department of painting and repairs, 7,000 feet of floor space being added to accommodate the new division.

This article is an absolute falsehood and our clients are suffering considerable damage by reason of its publication. The actual facts are: The W. R. Sherin Co. is a corporation duly organized and existing under and by virtue of the laws of the state of Wisconsin, with its office and principal place of business at Milwaukee, Wis. At the time of its organization, W. R. Sherin was its president, but later, intending to retire from active business on account of advanced age, he sold his stock to other parties, thereby disposing of any and all interest in said business. The W. R. Sherin Co. has associated with it, and interested in it, the active workers of the old reliable and reputable firm of G. W. Ogden & Co., and the reputation of the new firm of W. R. Sherin Co. is rapidly gaining the distinction of doing the best work possible in motor car and carriage building, painting and repairing. It now appears that the said W. R. Sherin has again decided to work, and associated himself with a competitor of the W. R. Sherin Co.—H. Friedrich, Attorney for the W. R. Sherin Co.